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General Heading: **BAKER MODEL "K" CEMENT RETAINER**

BAKER OIL TOOLS, INC.
Main Office and Factory:
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Central Division Office and Factory:
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Export Sales Office:
19 Rector Street, New York, N. Y.

Unit No. **A-11**

Subject: **Squeeze Cementing As An Economical Solution to Many Well Repair and Well Completion Problems**

Index: 250.1
Date: June 18, 1942
Page: 1 of 1 pg.

One of the oil industry's most important responsibilities today is to see that each and every well be capable of maximum production for the longest possible period of time, with a minimum expenditure of *time, money and materials.*

In this connection, "squeeze cementing" as a safe, economical solution to many well repair and well completion problems becomes increasingly important.

Thousands of such jobs have been successfully performed with the Baker Model "K" Cement Retainer, and details of two such typical jobs are given herein.

If you are confronted with water problems, or other well repair or completion problems, which may be solved through the use and proper placement of cement, check on the results other operators have secured with the Baker Model "K" Cement Retainer.

You can obtain details from any Baker office or field representative.

For complete details concerning design, construction and operation of the Baker Model "K" Cement Retainer, see pages 250-263 of the 1942 Baker or Composite Catalog.

Product No. 400

Baker Model "K" Cement Retainer

BAKER MODEL "K" CEMENT RETAINER APPLICATIONS

Recementing
Cementing Behind Sections of Pipe
Reducing Gas/Oil Ratios
Plugging Off Bottom Fluids
Plugging Back to Upper Zones
Testing Upper Cased Formations
Squeeze Jobs
Cementing Off to Perforate for Production
Cementing Bad Pipe
Cementing Two Strings Together
Cementing Low-Pressure Zones
Use of Cement Retainer as Casing Bridge Plug

Service Note

Competent Baker men will service, make suggestions, and otherwise assist in securing best possible results.

JOB. NO. 1

PROBLEM:

To Repair Split in Casing Through Which Shale Was Entering and Hampering Pumping Operations.

METHOD:

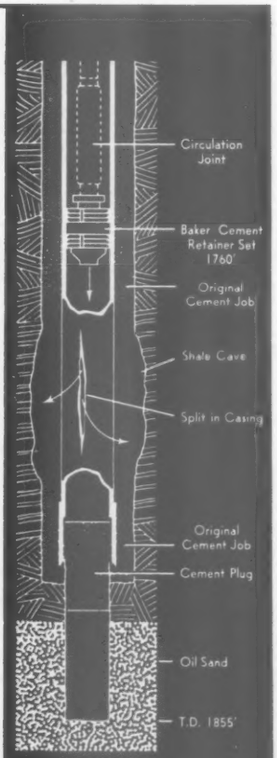
Set Baker Cement Retainer above Casing Split and Do Squeeze Job. (A Cement Bridge was Placed at Top of Producing Zone.)

RESULT:

100% Successful.

*** DETAILS ***

Field: *Salem, Illinois*
Depth of Well: *1855'*
Depth Retainer Set: 1760'
Breakdown Pressure: *800 lbs.*
Final Pressure: *1000 lbs.*
Number of Sax Mixed: *30*
Number of Sax Put Away: *30*
How Cement Discharged: *Through Casing Split in Shoe Joint*



Squeeze Cementing with Baker Cement Retainer to Repair Casing Split

JOB NO. 2

PROBLEM:

To Reduce Gas/Oil Ratio in a Field Where Normal Ratio is 60,000:1.

METHOD:

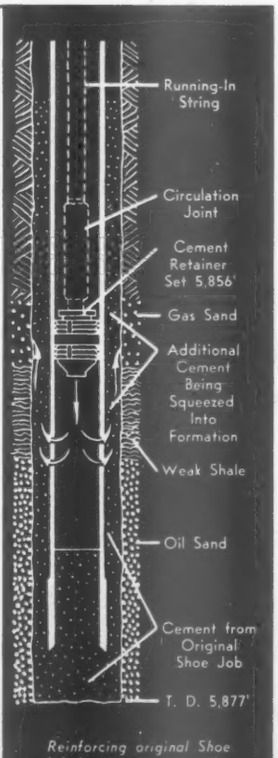
Before well completion Perform a Squeeze Cement Job with Baker Cement Retainer.

RESULT:

Well Completed with Gas/Oil Ratio of 550:1.

*** DETAILS ***

Field: *Grapeland, Texas*
Depth of Well: *5877'*
Depth Retainer Set: *5856'*
Breakdown Pressure: *1500 lbs.*
Final Pressure: *5000 lbs.*
Quantity of Cement Mixed: *125 sax*
Number of Sax Put Away: *13*
How Cement Discharged *Through 20 shot perforations in Shoe Joint*



Reinforcing original Shoe Job by squeeze cementing with Baker Cement Retainer to insure exclusion of free gas.

Trends

Multiple Areas Will Derive Benefit From World's Biggest Line

ASSURANCE of pipe-line relief before the year ends for two of the most severely war blighted petroleum-producing and consuming centers of the country stood out like the proverbial sore thumb in the week's oil development. Governmental approval of the East Texas-Salem, Ill., segment of the 24-in. crude line is one of the first affirmative steps taken in Washington effecting the general petroleum-industry economy since the war precipitated maladjustments in practically every normal function of this business.

The only developments that could have received higher billing would have been simultaneous approval of the eastern leg of the big line all the way to the East Coast or the resumption of uninterrupted tanker traffic between the Gulf Coast and Atlantic ports.

Sources from which the war pipe line may draw its crude are almost as numerous as the fields in the Southwest. Crude, if desired, may be moved from Oklahoma south to Longview, Tex., and then back north to Salem. Part of the stream may be drawn from West Texas, New Mexico, the Panhandle, or North Texas through existing systems that pass within connecting distance of the war line's southern terminal. East Texas crude will be easily accessible while Gulf Coast and Southwest Texas oils can be brought north to Longview by reversing arteries that now handle southbound traffic from East Texas to coastal refining centers. Northern Louisiana and southern Arkansas crudes also may be injected into the system. Selection of crude types will be as diverse as the sources.

The new line is no panacea for all the war ills of the petroleum industry. But allocation of the steel and government financial support of the line came at a time when producers and refiners alike were about to despair of transportation relief for duration of the war.

Full capacity of the new war line, 300,000 to 350,000 bbl. daily, will not accrue to Southwest and Mid-Continent producers. Some of the tank cars that are now loading at Texas and Louisiana coastal ports will be diverted to the discharge of the pipe line for movement of crude over the shorter route to East Coast refineries. Still, the relief will be considerable. Viewed from the poorest possible aspects, it would seem that at least 100,000 bbl. of the line's capacity will be crude that otherwise might not reach East Coast refineries and oil which would back up in producing fields as underground reserves or aboveground stocks without the 24-in. outlet.

CRUDE PRODUCTION *3,744,310 bbl. daily average — up 120,780 bbl. One year ago 3,834,220 bbl.*

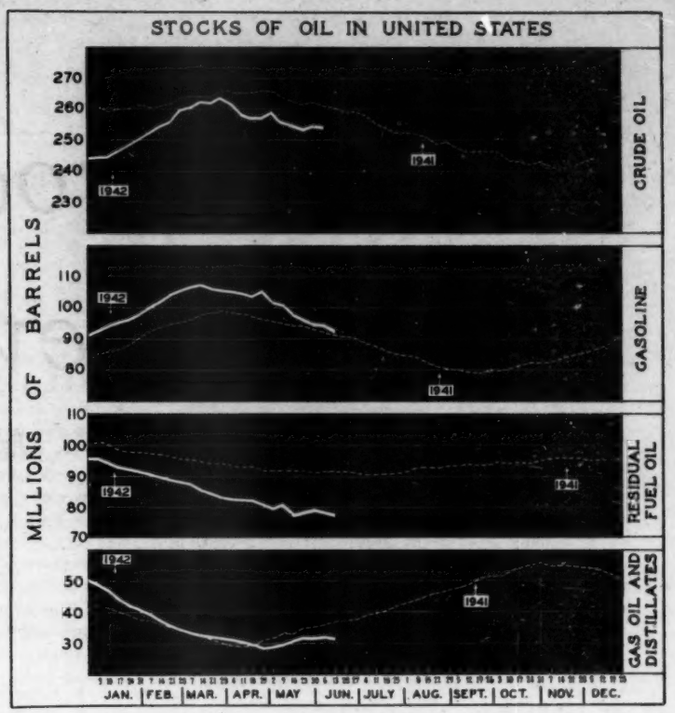
CRUDE STOCKS *254,316,000 bbl. as of June 6—down 707,000 bbl. One year ago 260,956,000 bbl.*

GASOLINE STOCKS *91,994,000 bbl. as of June 13—down 1,311,000 bbl. One year ago 91,431,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *78,759,000 bbl. as of June 13—down 797,000 bbl. One year ago 91,700,000 bbl.*

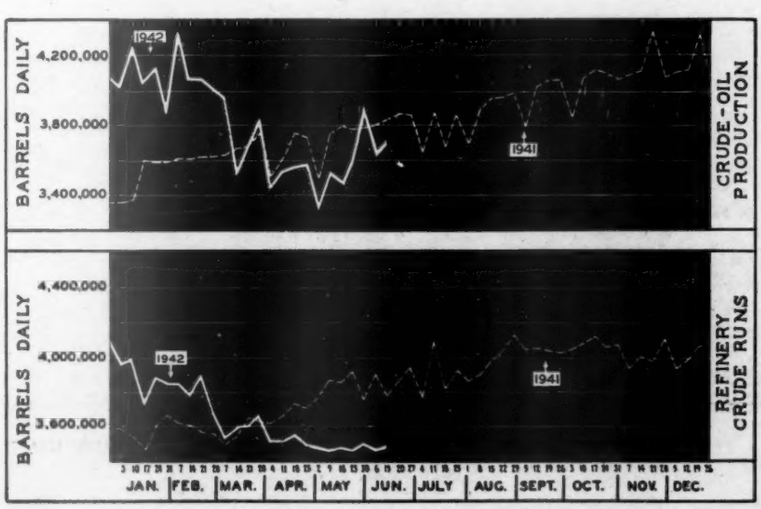
GAS OIL AND DISTILLATES *31,276,000 bbl. as of June 13—down 259,000 bbl. One year ago 37,019,000 bbl.*

REFINERY RUNS *3,478,000 bbl. daily week ended June 13 — up 27,000 bbl. One year ago 3,782,000 bbl.*



DAILY AVERAGE PRODUCTION FOR WEEK

	June 13, 1942 crude oil	June OPC recommended production all oils	June 6, 1942 crude oil
Arkansas	73,700	75,300	73,200
California	670,500	691,900	602,250
Colorado	7,020	7,600	7,065
Eastern fields	106,750	106,800	101,000
Illinois	276,890	320,800	293,765
Indiana	22,150	18,900	21,300
Kansas	279,750	281,900	218,300
Louisiana	308,650	311,300	302,900
North Louisiana	*88,600*	.....	*87,150*
Louisiana Gulf Coast	*220,050*	.....	*215,750*
Michigan	69,800	63,100	65,500
Mississippi	85,150	49,200	84,230
Montana	21,350	23,400	22,700
Nebraska	3,700	4,100	3,950
New Mexico	80,490	80,600	74,720
Oklahoma	375,650	436,600	380,200
Texas	1,266,500	1,068,600	1,275,550
East Texas	*362,600*	.....	*368,650*
West Texas	*204,800*	.....	*207,100*
North Central Texas	*149,400*	.....	*149,500*
East Central Texas	*87,600*	.....	*78,600*
Texas Panhandle	*87,300*	.....	*87,000*
Texas Gulf Coast	*320,550*	.....	*326,650*
Southwest Texas	*54,250*	.....	*58,050*
Wyoming	96,260	96,200	96,900
Total United States	3,744,310	3,636,300	3,623,530
Total production, Jan. 1-June 13, 1942	624,072,745 bbl.		
Same period last year	598,847,595 bbl.		



Illinois' Production Trend May Be Reversed

By HARRY F. SIMONS

CENTRALIA, Ill.—The oil-production trend in Illinois continued downward during May with the total production for the month (31 days) being 112,000 bbl. over that for April; this is a daily average of approximately 287,000 bbl. for April as compared with an average of 281,000 bbl. for May. However, the normal annual trend for the state's production is downward during the first 4 months of the year with an upward surge taking place during the latter months and this year will probably show the same general course. Most observers in the state feel that the state's output will begin to climb shortly, or at the very worst, will maintain its present level.

There are several courses open to producers in the state for bolstering the production from the area. The first is an increase in the discoveries through more intensive wildcatting; the second is through a wider application of multizone production technique; the third is through a well-planned deepening campaign; the fourth is through inauguration of more secondary-recovery work.

Illinois has occupied a unique position since the discovery of major oil production in the area in 1937. Its proximity to the large middle western and eastern markets has allowed it to sell as much oil as it can produce. At the present time an increase in that state would be of great help in alleviating the shortage on the East Coast. The chances of Illinois increasing its oil production or maintaining its present output are discussed in this article.

Group present during the running of electric log on the Obering & Bryant 1 Becker heirs the second well in the St. Jacob pool in Madison County, Illinois. From left to right: T. W. Eason of T. T. Eason & Co. drilling contractors on the well, M. D. Bryant, San Angelo, Tex., J. P. Darnell, production superintendent, Paul Waterbury, geologist, and E. A. Obering

The largest and most spectacular increase may be expected from new discoveries or through extensions and new horizons in fields already developed. The discoveries so far this year have been numerous but small. A glance at Table 1 will show none outstanding up to the present time. However, there are several which may develop important production.

The production statistical history of the state indicates clearly the importance of a single prolific field on the state's output. Last year it was Johnsonville during the early part and Rural Hill during the latter part of the year which caused the peaks. The development of the small fields plus the work in the already exploited areas partially offsets the decline allowing the flush pools to boost the state's total.

There is still ample room for the discovery of a number of large pools in the state and the op-

TABLE 1—NEW FIELD DISCOVERIES IN ILLINOIS IN 1942

(As of June 9, 1942)

Pool and County—	Company and farm—	Location	Total depth (ft.)	Depth to top (ft.)	Prod. formation	Initial prod. (bbl.)	Date of comp. of discovery well	No. of producing wells
Samsville, Edwards	Menefee 2 McDowell	SW SE NE 31-1n-11e	2,437	2,403	Waltersburg sand	20	1-20-42	1
Plainview, Macoupin	Whipple 1 Rhoades	NW SE SW 35-9n-8w	421	400	Pennsylvanian sand	10	1-27-42	1
Sims, N., Wayne	Texas Co. 2 Talbert	S SW SE 17-1s-6e	3,209	3,183	McClosky lime	303	1- 6-42	3
Bible Grove, Clay	Cameron Brothers 1 Landwehr	NW NW NE 8-5n-7e	2,825	2,810	McClosky lime	695	3-24-42	5
Akin, Franklin	Seaboard Oil Co. 1 U. S. Coal & Coke Co.	C SW SE 14-6s-4e	2,860	2,839	Cypress sand	113	3-24-42	2
Tamaroa, Perry	Harsh 1 Newborn	SE SE NW 22-4s-1w	1,150	1,127	Cypress sand	16	3-24-42	3
Carmi, N., White	Seaboard Oil Co. 1 Gates	SW NW SW 3-5s-9e	3,240	3,228	Aux Vases sand	62	3-24-42	2
Concord, White	Minerva Oil Co. 1 Ramsey	N SW NE 33-6s-10e	2,917	2,904	Aux Vases sand	28	3-17-42	1
Albion, N., Edwards	Taylor Drilling Co. 1 Odle	S SE SW 30-1s-11e	3,261	3,054	Aux Vases sand	19	3-31-42	1
Coil, Wayne	First National Petroleum Trust 1 Ellis	C SW NE 18-1s-5e	2,940	2,918	Aux Vases sand	450	3-31-42	6
New Bellair, Crawford	Krohn 1 Wiman	N NE SE 19-8n-13w	1,380	1,169	Pennsylvanian sand	55	3-10-42	1
Johnsonville, W., Wayne	Bell Brothers 1 Jones	W NE SE 24-1n-5e	3,113	3,107	McClosky lime	8	3-10-42	1
Kell, Jefferson	Deaton & Bears 1 Howard	NE NE NW 5-1s-3e	2,627	2,625	McClosky lime	192	4-21-42	1
Kenner, Clay	L & W Drilling Co., Sanders 1 Thompson	N NW SE 30-3n-6e	2,715	2,661	Bethel sand	25	5-26-42	1
Sesser, Franklin	I. W. Taylor 1 Old Ben Coal Co.	E NW NE 19-5s-2e	2,716	2,701	Aux Vases sand	132	6- 2-42	1
Valier, Franklin	Menhall 2 Valier Coal Co.	NE NE SE 7-6s-2e	2,725	2,713	McClosky lime	15	5-26-42	1
Sailor Springs, S., Clay	J. H. Jones 1 Neeley	NE NW NE 11-3n-7e	2,958	2,940	McClosky lime	508	6- 2-42	1
Inman, W., Gallatin	B. Martin 1 Behl	SE SE NW 15-8s-9e	2,493	2,482	Cypress sand	75	5-19-42	1
St. Jacob, Madison	M. D. Bryant 1 H. Meyer	SW NE SE 16-3n-6w	2,354	2,278	"Trenton" lime	118	6- 2-42	1
Johnsonville, S., Wayne	N. V. Duncan 1 Anderson Rogers	C NE NE 14-1s-6e	3,229	3,212	McClosky lime	17	5-26-42	1
Extensions to Pools in Illinois in 1942								
Rural Hill, Hamilton	D. Ring 1 Craddock	NE SE NW 22-6s-5e	3,225	3,189	Aux Vases sand	180	1- 6-42	..
Bonpas, W., Richland	Bonpas Development Co. 2 Woods	W SW SE 21-2n-14w	3,097	3,090	McClosky lime	1,086	2-17-42	..
Maunie, N., White	Dawson et al 1 Clark	NW SW NE 36-5s-10e	3,094	3,048	McClosky lime	23	2-10-42	..
Herald, White	Carter Oil Co. 1 E. A. Martin	C SW NW 35-6s-9e	2,798	2,792	Bethel sand	72	3-10-42	..
Rural Hill, Hamilton	D. S. Ring 1 Johnson	C NW SE 21-6s-5e	3,257	3,170	Aux Vases sand	8	3-31-42	..
Noble, Richland	Pure Oil Co. B-1 W. G. Murvin	C NW NW 27-4n-9e	2,710	2,627	Cypress sand	165	4-14-42	..
Goldengate, Wayne	New Penn Development Co. 1 Harris	W NW NE 28-2s-9e	3,311	3,305	Rosiclare sand	201	4-14-42	..
Centerville, E., White	Sun Oil Co. 1 Hertlein	S SE NW 13-4s-9e	3,264	3,259	McClosky lime	90	4- 7-42	..
Bible Grove, Clay	Illinois Producers 1 Veith	SE SW NE 5-5n-7e	2,837	2,808	McClosky lime	66	6- 2-42	..
South Lawrence, Lawrence	W. R. White 1 Hershey	SE SW SE 27-2n-12w	2,023	2,024	Bethel sand	126	5- 5-42	..
Salem, Marion	Big Chief Drilling Co. 1 Boles	W SW NW 15-1n-2e	2,085	2,061	Rosiclare sand	48	5- 5-42	..

erators are starting out to find them. The Illinois Geological Survey Bulletin for May shows an interesting trend in wildcatting the like of which is probably not duplicated anywhere in the United States. The following table shows the permits for wildcats and pool wells issued by the Department of Mines and Minerals at Springfield, Ill.:

Month—	Wildcats	Pool wells
October	81	339
November	83	374
December, 1941	66	304
January, 1942	47	34
February	41	42
March	47	38
April	47	75
May	83	130

This shows a marked tendency for an increase in wildcatting which is almost certain to result in finding important new production. It is true that the foregoing table shows a marked decrease in pool-development work caused by M-68 but the discovery of a pool such as Johnsonville, Benton, Rural Hill, Dundas, Salem, Louden would result in considerable development work so that the oil could be available for shipment eastward.

Multizone Production

Estimates of the new production available through the full development of the multizone wells vary from 5,000 bbl. daily to as high as 30,000 bbl. with the majority falling in the 10,000 to 15,000-bbl. bracket. Obtaining of this production depends entirely on the relaxation of M-68 as the present rules prevent deepening or opening an upper horizon without special permission from OPC. So far approval on applications for exemptions have not come through very rapidly.

Operators interested in this work point out that there is probably no way of obtaining appreciable oil production with so little expenditure of steel. Gun perforating requires only the actual bullets used and the mills used for cutting out casing can be rebuilt. Production equipment is an extremely minor item.

An accompanying table (Table 2) shows the fields in which two or more zones have been developed either together or separately during the present year. It is evident that the possibilities for two-zone production extend over practically the entire present producing area and all of the possibilities are not listed. In the Salem pool, for example, there may be comparatively important oil in the Rosiclaire which could be obtained by working on the older wells. There is also some possible production between the McClosky and Devonian which could be developed.

In the wells equipped with 5½-in. casing or larger, it is now possible to gun perforate or mill out opposite an upper pay zone and then seal off this opening in case the upper zone is barren. This is an important feature as it permits an upper horizon to be developed without danger of damaging the lower zone.

The deepening of wells to the lower horizons does not present much in the way of new oil except in isolated cases. So far the zones below the McClosky have produced in a limited area although hope still exists for production from the older formations throughout the state. The possibilities are good enough to warrant testing of the deeper horizons in each pool with one or two wells. Such testing would require only the steel consumed in drilling to prove whether the zones were productive.

Biggest possible source of oil from such a program is the Trenton lime in the Salem pool in Marion County. Some of the depleted Devonian wells could be drilled approximately 900 ft. deeper and initials of from 100 to 300 bbl. obtained in the new pay. The extra liner and tubing required would be considerably less than that for the average well in the state and the production

(Continued on Page 32)

This Week...

TRANSPORTATION.—First leg of the war pipe line, the segment from Longview, Tex., to Salem, Ill., sanctioned by WPB. Contract awarded for pipe, specifying delivery over next 4 months. Completion scheduled by December 1. Capacity variable from 300,000 to 350,000 bbl. daily, depending on pump stations. Promises partial relief for East Coast shortage, increased outlet for Southwestern crude. . . . OPC authorizes industry barge committee, to study greater movement through inland waterways. . . . Rail shipments to East Coast increase slightly, remain below peak of late May. . . .

RUBBER.—Industry given chance to prove theories on scrap rubber. Intensive collection drive launched Monday, continues through June 30. Results will largely determine future of rationing. If drive equals or exceeds expectations, rationing may be checked, confined to East Coast. Otherwise, compulsory rubber saving practically certain. . . . OPC issues Directive No. 52. Seeks speed up of synthetic-rubber-component production, from existing refinery facilities. Door to synthetic-rubber program may be opening wider for oil industry, performance will count heavily in future government-directed production assignments. . . .

REFINING.—Formal approval given District 3 operating plan. Involves allocation of runs first, to refiners producing war materials; second, equitably among all others. Program applies, temporarily, only to coastal plants. . . . Ark-La-Tex section, W.P.R.A., hears motor-fuel sulfur specifications sharply criticized, held arbitrary and of little true significance. . . . Louisiana considers repeal of 1 cent per barrel processing tax, to attract new plant at Lake Charles. . . .

MARKETS.—Price ceilings removed from aviation gasoline, 91 octane and higher; toluene; butadiene and styrene and a long list of components of each. Government hopes to stimulate production from embryonic branches of industry. . . . Wholesale distributors and jobbers included in prohibition against changing from "split" to "exclusive" accounts. . . . Average of 30 active oil stocks rallied to high of 21.17, closed lower at 20.79, last week. . . .

LEGISLATIVE.—House committee votes increase of 2 cents in lubricating-oil tax, Treasury had proposed 6-cent advance. New approved rate stands at 6 cents, but has Senate committees and Congress to weather. . . . House approves permanent retention of Connally hot-oil law, now goes to White House. Prevents interstate shipment of oil or products produced in excess of state allowables. . . .

PRODUCTION.—Discoveries in the Tuscaloosa, Woodbine equivalent, in East Central Louisiana and in the Paluxy, Wood County, East Texas, open new exploratory provinces. . . . Daily average output increased 120,780 bbl. . . . Argentina's crude production increased to 7,770,595 bbl., first 4 months this year, up 10.4 per cent. . . . Producers luke-warm to suggestion that service derricks be scrapped. Government claims 300,000 tons of steel tied-up in little-used derricks. . . . Texas reduces last-half-of-June allowable 59,466 bbl. daily. . . .

PRIORITIES.—Application and extension of all preference ratings simplified after July 1, except those limiting kinds of materials. Others may be applied, after July 1 by endorsing purchase orders. . . .

INVENTORY.—Texas commission issues rule requiring weekly report on crude stocks, for more accurate check on current trends. Interim adjustments of allowables may be more frequent, depending on how storage figures shift. . . . Total crude stocks again turn downward. . . . Decline of distillate fuel and gasoline continues on East Coast, residuals holding approximately level. . . . Texas crude stocks up 1,516,000 bbl., leading to allowable reduction, mostly in East Texas. Imported crude stocks rose 82,000 bbl.

INTERNATIONAL.—Caribbean shipping reported improving, after tight clamp on sailings during early stages of submarine campaign. . . . Aruba and Curacao refineries operating below normal. . . . Exploration intensified on western coast of Ecuador and in Colombia. . . . Argentina negotiating for French tankers at Martinique. Government imposes rationing, to offset deficiency of imports. . . .

Unloading 100-octane gasoline from an invasion barge at a southern Pacific island. Here's why total petroleum demand does not fully reflect civilian curtailment

International News photo

Industry Moves Promptly on Building Big Pipe Line

By HENRY D. RALPH

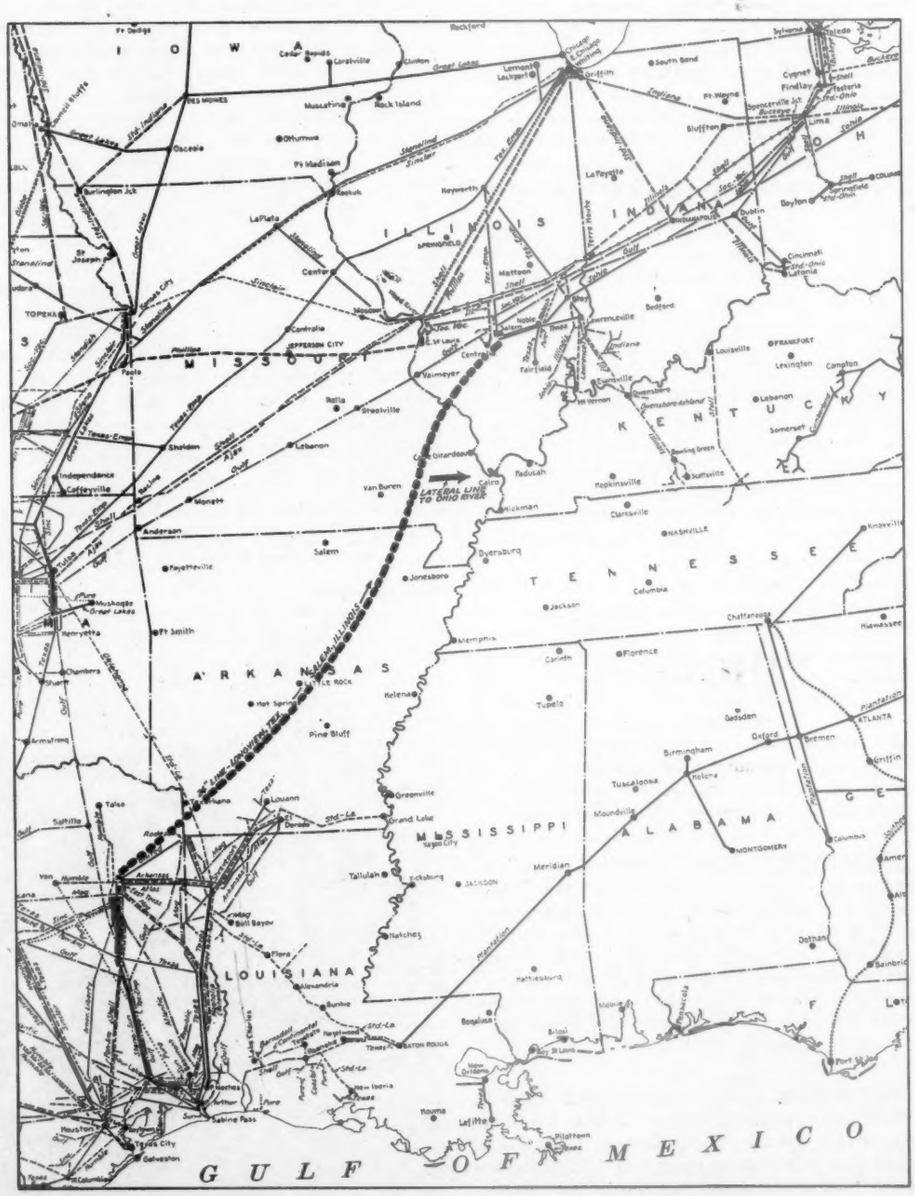
WASHINGTON, D. C.—Construction of a 24-in. crude line from the East Texas field to Salem, Ill., was authorized by the War Production Board late in the afternoon of June 10, and by the end of the week the contract for the pipe had been let and other arrangements for actual construction were well under way.

By rushing the job throughout, the 550-mile line is expected to be completed by December 1, delivering some 300,000 bbl. of crude daily to terminals in the vicinity of Salem from where most of it will be shipped to Atlantic Coast refineries by rail and barge.

The line is part of the so-called National Defense pipe line proposed a year ago by major oil industries and endorsed by the Office of Petroleum Coordinator to reach from Texas to the New York and Philadelphia areas. On three previous occasions the War Production Board and its predecessor organizations in charge of metal allocations declined to permit the use of steel for construction of this line. Approval of one section of the line came last week after the OPC had submitted to WPB a detailed report pointing out the necessity for new facilities for moving oil to the Atlantic Coast area to meet minimum essential needs this winter without reliance on extensive tanker movements.

The WPB committee, headed by Wayne Johnson, will study the question of extending the line to the East Coast at a later date, and Petroleum Coordinator Harold L. Ickes declared that he hopes for eventual completion of the entire project. Meanwhile, the line to Salem will greatly shorten the round-trip run of tank cars now hauling crude to the East by rail.

The 550 miles of line will require approximately 125,000 tons of finished steel. Because of the shortage of steel plates the pipe will be seamless drawn tubing instead of welded plate, and cast iron will be substituted for steel in some places. The WPB announced that it had agreed to the allocation after receiving assurances that prompt construction of the line will not interfere with delivery of steel or motor equipment orders for the War and Navy departments or for the Maritime Commission's shipbuilding program.



The 24-in. pipe line, approved finally by War Production Board, ties into a vast network of systems in the Southwest assuring the carrier of capacity loads at all times after its completion next December 1

Will Originate at Longview, Tex.

The line will originate at Longview, Tex., where it will be fed by gathering lines, and it will terminate in the vicinity of Salem in the oil-producing region of southern Illinois. Plans contemplate the extensive use of existing pipe lines connecting with railroad tank-car loading joints at Bridgeport, Stoy and Martinsville, Ill., and Lima, Ohio, where there are facilities capable of handling approximately 150,000 bbl. per day, together with required storage space. Another 100,000 bbl. per day will be delivered by a branch line to a yet undesignated point on the Ohio River where it will be barged to Pittsburgh and moved east by rail and existing pipe lines. Movement of 20,000 bbl. per day can be handled by pipe line from Salem to Chicago, and by Great Lakes tankers to Buffalo, N. Y.

While the capacity of the line is given as 300,000 bbl. per day, engineers say it could easily handle 350,000 bbl., or even considerably more with the addition of more pumping stations. In diameter and capacity it will be the largest oil pipe line in the world. Plans call for 10 pumping stations, approximately 55 miles apart, each with perhaps three pumps.

The line will cost between $35,000,000 and $40,000,000, and will be financed by the Reconstruction Finance Corp. The line will be a common carrier, but will be owned by a corporation formed by the major oil companies who will make the most use of it. Last summer, when the project was first advanced, the National Defense Pipe Line Co. was incorporated in Delaware, but it has not yet been decided whether this nascent corporation or a new one will build and operate the line.

Completion of the corporate structure, however, is not delaying the project, due to the fact that

the OPC had previously authorized the appointment and functioning of a Pipe Line Managing Committee of the Petroleum Industry War Council, chairman of which is W. Alton Jones, president of Cities Service Co. This committee has authority to make contracts, and has received a financing commitment from the RFC.

Pipe-Delivery Schedules

An order for the pipe has been placed with the National Tube Co. of Pittsburgh, Pa., with delivery schedules as follows: July, 140 miles; August, 170 miles; September, 130 miles; October, 110 miles. Contracts for pumps and for construction are expected to be let shortly. The pipe will be in "double random" lengths of approximately 40 ft. each, with a wall thickness of ⅜ in. Until recently it had been intended to build tapered sections, with walls varying from $\frac{7}{16}$ to $\frac{5}{16}$ in. thickness on the theory that steel could be saved by using thinner pipe at greater distances from pumping stations where the pressure is lower, but it was found that faster deliver could be obtained by drawing all the tubing with the same thickness.

Immediately after WPB agreed to allocate the steel, Secretary of Commerce Jesse Jones made a commitment to W. Alton Jones for RFC financing. The authorization was made to the nine companies expected to hold majority interest in the new corporation, these being the Sinclair Refining Co., Atlantic Refining Co., Sun Oil Co., Standard Oil Co. of New Jersey, Socony-Vacuum Oil Co., Inc., Gulf Oil Corp., Texas Co., Tide Water Associated Oil Co., and Cities Service.

The secretary authorized Mr. Jones' committee to make contracts with equipment suppliers and construction companies, but all such contracts must be approved by the chief engineer of the RFC.

Engineering plans and surveys already made by interested companies are to be contributed to the enterprise without cost, and additional companies are to be allowed to participate if they desire.

NEXT WEEK

The Annual GULF COAST Number

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Featuring . . .

● Special section devoted to developments in refining and

Petro-Chemistry

— a branch of the industry in which limitless potentialities are now being actively explored and commercially exploited.

● Progress in drilling, completion and production practices.

● Complete data on field operation with detail maps of the entire area.

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Price Ceilings Removed From Three Petroleum Products

WASHINGTON, D. C.—Price ceilings on synthetic rubber, aviation gasoline, toluene and materials essential to their manufacture were removed June 13 by Price Administrator Leon Henderson to spur industrial expansion deemed necessary to produce an increasing volume of these vital war necessities.

Mr. Henderson's action came in an amendment (No. 7) to Supplementary Regulation No. 1 to the General Maximum Price Regulation, and an amendment (No. 18) to Revised Price Schedule 88, covering petroleum and petroleum products. Both are effective today.

Specifically, these amendments except from price regulation: (1) Aviation gasoline of 91-octane rating or higher; (2) Basic materials and components used in its manufacture; (3) Synthetic rubber, in terms covering eight types; (4) Basic materials and components used in such manufacture; (5) Toluene (petroleum product widely used in explosives); and (6) Base stocks from which toluene is produced.

These amendments were made after other government agencies had asked for the exemptions to further increased production of the commodities. The price ceilings are removed, Mr. Henderson explained, to permit complete price flexibility during the formative stages of industry expansion to meet critical wartime demands.

Aviation gasoline of 91-octane rating or higher already had been excepted from provisions of Revised Price Schedule No. 88 but it still came under ceiling provisions of the General Maximum Price Regulation on May 11. This ceiling is removed now.

The amendment to Supplementary Regulation No. 1 declares that the General Maximum Price Regulation shall not apply to any sale or delivery of the following commodities:

1. Aviation gasoline of 91-octane rating or higher, as mentioned above;

2. The following, to the extent sold or delivered for use in the manufacture of such aviation gasoline: components of such gasoline, including but not limited to alkylate, neohexane, isooctane, hydrocodimers, isomate, and hot acid octanes; isopentane, isobutane, normal butane and butylenes; and aromatic hydrocarbons and base stocks or fractions thereof;

3. Synthetic rubber, including rubber of the butadiene-styrene copolymer, parbunan, neoprene, thekol, butyl, koroseal, flammenol and acrysol types;

4. The following, to the extent sold or delivered for use in the manufacture of synthetic rubbers: components of synthetic rubbers, including but not limited to butadiene and styrene; all hydrocarbons and petroleum fractions used in the manufacture of butadiene and styrene, including but not limited to ethylene, propylene, butylene, isobutylene, propane, butane and isobutane; hydrogen, acetaldehyde, acetylene, vinylacetylene, vinyl chloride, vinyl acetate, sebacate esters, phthalate esters, tricresyl phosphate, hydrochloric acid, calcium carbide, ethylene dichloride, dichlorethyl ether, sodium polysulphide, butylene glycol, and acrylonitrile;

5. Toluene manufactured from petroleum;

6. The following to the extent sold or delivered for use in the manufacture of such toluene: base stocks from which toluene is to be extracted, and selected charging stocks to be processed for the synthesis of such toluene.

The amendment requires that duly authenticated copies of all contracts involving sale, purchase or exchange of the exempted commodities be filed with OPA within 15 days after the signing of such contracts.

The amendment to Revised Price Schedule No. 88 excepts from the revised schedule the components of aviation gasoline and synthetic rubber to conform with the exceptions in Supplementary Regulation No. 1. It also excepts from ceiling provisions toluene manufactured from petroleum.

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Compact to Review Savings by Secondary Recovery

OKLAHOMA CITY.—Saving steel by the use of water, air and gas in making available great petroleum reserves will be surveyed when the Interstate Oil Compact Commission meets June 19-20 at Lexington, Ky., to study secondary recovery.

With oil-well completions off 40 per cent, the use of water flooding and air or gas repressuring to stimulate depleted pools has a greater importance.

Secondary recovery is more than a theory, for already the American oil industry has invested more than $215,000,000 in such projects in 14 states.

Four standing compact committees will compile reports June 19 on particular phases of secondary recovery, and the next day at the general session, four nationally known experts on secondary recovery and the four committee reports will survey the entire picture.

Paul D. Torrey, Houston, Tex., consulting geologist and petroleum engineer, will address the general session on "Application of Secondary Recovery in the United States."

Recent experiments in water flooding in New York and Pennsylvania will be reported by Dr. S. T. Yuster, who is in charge of petroleum-production research at the Pennsylvania State College experiment station, State College, Pa.

Dan J. Jones, Kentucky state geologist, Lexington, will discuss secondary-recovery operations in the western Appalachian region of Ohio, West Virginia and Kentucky.

E. O. Bennett, Ponca City, Okla., chief petroleum engineer for the Continental Oil Co., will talk on pressure maintenance.

Scrap-Rubber Drive Supported By All Branches of Industry

By HENRY D. RALPH

WASHINGTON, D. C.—Launched by a radio address by President Roosevelt and guided by the War Production Board and the Office of Petroleum Coordinator, the oil industry this week began a nation-wide campaign to collect all possible scrap rubber during the last half of June.

The plan has been some time in preparation but was not announced until June 12, shortly before the president addressed the nation in a plea to all citizens to turn in all available used rubber articles to any filling station in the country.

Filling stations will pay 1 cent per pound for all scrap rubber turned in, and the oil companies will collect it and turn it over to the Government at $25 per ton. Any profit beyond the cost of reimbursing filling stations will be donated to charity, and the oil industry will not profit from the campaign.

One primary purpose of the rubber collection campaign is to ascertain how much reclaimable rubber there is in the United States, since estimates have varied tremendously. On the results of this collection drive may hinge the decision as to nation-wide gasoline rationing, since the amount of reclaimed rubber available for passenger car tires will be a determining factor in deciding whether or not motorists must be forced to curtail the use of their present tires to make them last 2 years or more.

Military Needs Have First Call

There is no promise, however, that the rubber collected by the oil industry will find its way back to many motorists in the form of reclaimed-rubber tires and retreading materials. It is made clear that the Army and Navy have first call on all rubber resources and that civilian tires will be available only when all war needs are met.

The collection drive was planned by the PIWC. on behalf of the entire industry, working in close cooperation with the White House and several government agencies. In addition to performing a patriotic service, the council was spurred by the hope of maintaining a market for gasoline by keeping mechanically usable passenger cars on the road through the use of reclaimed rubber for retreads and new tires. A plan for accomplishing this by using what was described as relatively small quantities of reclaimed rubber and very little natural rubber was outlined to the council at its June meeting by its special committee on rubber economics. A review of this report appeared in The Oil and Gas Journal, June 11, Page 26.

The collection program was announced by President Roosevelt at his Friday morning press conference and was followed immediately by announcements from cooperating agencies. William R. Boyd, Jr., chairman of the PIWC, held a special press conference and released a bulletin giving details of the plan. Other announcements came from the OPC, the Rubber Reserve Co., and the Bureau of Industrial Conservation of the War Production Board.

Conservation Bureau Puts Full Weight Behind Plan

WASHINGTON, D. C.—Detailed plans for the all-out, nation-wide scrap-rubber-collection campaign to be conducted in accordance with the president's direction were announced by Lessing J. Rosenwald, chief of the Bureau of Industrial Conservation.

The campaign is designed to reach into every home and industrial plant, to stimulate the flow of as much scrap as possible into the nation's war supply. Main points of the plan are as follows:

1. The campaign begins at 12.01 a.m., June 15, and ends at midnight June 30.

2. The Bureau of Industrial Conservation will supervise the campaign, working in close cooperation with the Office of the Petroleum Coordinator and the Petroleum Industry War Council.

3. Local salvage committees set up by the BIC in every state—there are now over 12,000 such committees—will play a major role in the effort locally and will work with regional and local representatives of the petroleum industry.

4. All scrap rubber coming from citizens during the campaign will be turned in by them at service stations.

5. Filling stations will pay for reclaimable rubber at the uniform rate of 1 penny a pound.

6. Oil companies which serve the service stations will collect the rubber and take it to central concentration points.

7. The oil companies, taking title to the rubber, will sell mixed scrap to the Rubber Reserve Co. (RFC) at the rate of $25 per short ton (2,000 lb.) in carload lots.

8. The excess resulting from the difference between $20 a short ton, paid to the citizen, and the price paid by the Government to oil companies will be turned over to designated charities.

9. The Government will store the scrap rubber in warehouses and it will then be allocated to reclaimers' plants at the direction of the WPB.

10. Industrial scrap, as differentiated from scrap uncovered by private citizens may either be sold to oil companies at bulk distributing stations or sold through the usual channels of trade.

11. The oil companies, playing a major role in the effort, will, in addition to making service stations available as collection points, use much of their personnel to stimulate the flow.

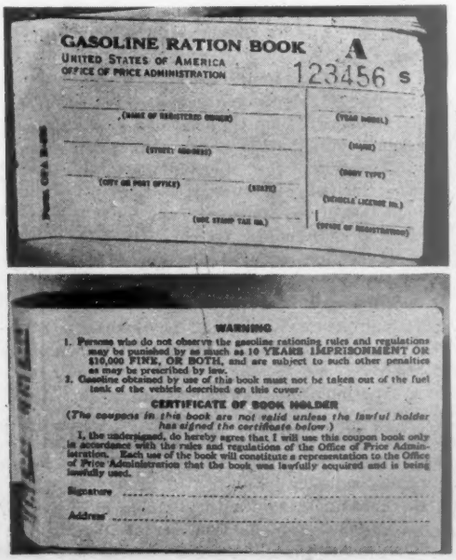
12. A report on the total amount of rubber collected at service stations in this special campaign will be made available to the Government within a short time after the close of the effort.

Additional aspects of the campaign have been set forth in telegraphic instructions sent by the BIC to its state salvage offices. The most important part of these instructions follows:

TO: Executive Secretaries and State Chairman of all State Salvage Committees.

FROM: Herbert L. Gutterson, chief of general salvage, Bureau of Industrial Conservation, War Production Board.

During the period from the receipt of this telegram until the close of this special drive you are requested to devote all the time and energy


GASOLINE RATION BOOK A
UNITED STATES OF AMERICA
OFFICE OF PRICE ADMINISTRATION
123456 s
WARNING
CERTIFICATE OF BOOK HOLDER
BUY WAR BONDS STAMPS
Conserve gasoline and tires. Careful upkeep and common-sense driving will increase your gasoline mileage and lengthen the life of your car.
Any person finding a lost coupon book should mail it or return it at once to the nearest rationing board.

In the background of the scrap-rubber drive is a desire of civilians, government officials and oil companies to prevent spread of rationing books like this which becomes permanent equipment for eastern motorists

possible to this drive. All other field representatives of the Bureau of Industrial Conservation in your state are being directed to do likewise and for the period of this drive are to report to you and work under your direction.

The supervision of this drive is under the direction of the Bureau of Industrial Conservation. Your state and local salvage committee should work in cooperation with the oil industry's state and local representatives.

Please immediately give full instructions to all of your paid and volunteer organizations including state, county and local salvage committees of the Defense Councils that it is their duty to do everything within their power to stimulate the flow of reclaimable scrap rubber to the gasoline stations and oil bulk plants of the country.

Aside from the obvious purpose of bringing in vitally needed scrap rubber, one of the important purposes of this drive is to provide immediate factual data on the amount of reclaimable rubber in this country. For this reason the following important policies have been set down:

1. Accurate and complete reports will be requested of every unit in the oil industry of the amount of scrap rubber collected, immediately after the end of the drive.

2. All scrap rubber salvaged by the public should flow through the oil industry's stations and bulk plants. In addition, large quantities of scrap rubber such as may be in the hands of industrial plants, auto graveyards, etc. may be sold directly to the nearest oil company bulk station.

Oil Companies and Public Officials Urged to Aid

WASHINGTON, D. C. — Removal of any obstacles which interfere with the scrap-rubber-collection drive was urgently requested of the governors of each of the 48 states and the mayors of cities by Petroleum Coordinator Ickes.

In telegrams sent to each governor and to the mayors of all cities of 50,000 population and over, the coordinator said:

"Your support of the campaign by public utterance and otherwise is urgently requested and I trust that any laws (and ordinances) existing which might otherwise interfere with the collection, transportation, and purchase of rubber scrap by the oil industry may be relaxed for the period of the drive."

Telegrams also were addressed by the coordinator to each of several hundred oil companies the nation over, requesting that they assign their entire organization—including personnel, plants, and transportation facilities—to the successful prosecution of the drive.

Abolishment of Obstacles Asked

The following is the text of the telegram sent by Coordinator Ickes to the governors and mayors:

"President Roosevelt has ordered an intensive 2 weeks' drive throughout the nation to bring in from homes, offices, factories, and farms, all articles of rubber which have been or can be discarded, the same to be purchased by the oil industry at a penny a pound and resold to the Government. In this connection I have telegraphed the heads of oil-industry units throughout the nation as follows:

" 'In keeping with the president's wish and in collaboration with the Bureau of Industrial Conservation of the War Production Board which has delegated responsibility for the petroleum industry's activities in this drive to the Office of the Petroleum Coordinator for War, I call on you as I am calling on every unit of the oil industry

PART OF THE PRESIDENT'S RUBBER APPEAL—

I WANT to talk to you about rubber—about rubber and the war—about rubber and the American people.

When I say rubber I mean rubber. I don't mean gasoline. Gasoline is a serious problem only in certain sections of the country.

Rubber is a problem for this reason—because modern wars cannot be won without rubber and because 92 per cent of our normal supply of rubber has been cut off by the Japanese.

That is serious. It would be more serious if we had not built up a stock pile of rubber before the war started, if we were not now building up a great new synthetic-rubber industry. That takes time, so we have an immediate need.

You and I want the finest and most efficient Army and Navy the world has ever seen—an Army and Navy with the greatest and swiftest striking power. That means rubber—huge quantities of rubber—rubber for trucks and tanks and planes and gun mounts—rubber for gas masks and rubber for landing boats.

But it is not the Army and Navy alone which need rubber. The process of production also needs rubber. We need rubber to get our war workers back and forth to their plants—some of them far from workers' homes. We need rubber to keep our essential goods and supplies moving.

All this adds up to a very serious problem—a problem which is a challenge to the sound judgment of the Government and to the ingenuity of the American people. It is a problem we Americans are laboring to solve—a problem we will solve.

But there is one unknown factor in this problem. We know what our stock pile is. We know what our synthetic capacity will be. But we do not know how much used rubber there is in the country—used rubber which, reclaimed and reprocessed, can be combined with our supplies of new rubber to make those supplies go farther in meeting military and civilian needs.

There are as many opinions as there are experts, and until we know we can't make our plans for the best use of the rubber we have.

The only way to find out is to get the used rubbed in where it can stand up and be counted.

We have asked the filling station operators—the thousands upon thousands of citizens who operate gas stations and garages from one end of the country to the other—to help. And they have generously and patriotically agreed to help; they and the oil companies which serve them.

They have agreed to take the old rubber in and to pay for it at the standard rate of a penny a pound—an amount which will later be refunded to them by the Government.

Once the rubber is in, we will know what our supplies of used rubber are and we will make our plans accordingly. One thing you can be sure of—we are going to see to it that there is enough rubber to build the planes to bomb Tokyo and Berlin—enough rubber to build the tanks to crush the enemy wherever we may find him—enough rubber to win this war.

INDUSTRY'S ACCEPTANCE OF ASSIGNMENT—

THE president has ordered a campaign of inestimable importance to our effort and to the American people," said William R. Boyd, Jr., chairman of the Petroleum Industry War Council, which is sponsoring the petroleum industry's participation in the scrap-rubber drive.

"The oil industry has never failed to respond to any request of our president or our Government. Mr. President, we are organized and ready to go! Over a million men and women connected with the oil industry are ready for the takeoff signal and all our facilities—our 400,000 service stations, our automotive equipment, our cash, will be put to work for the scrap-rubber drive.

"Every ton, every pound, every piece of reclaimable scrap rubber in America must be quickly gathered and stockpiled. We believe the total tonnage figure will be astounding, but the only way to find out is to go and get it.

"It has often been said that the oil industry in World War I floated the Allies to victory on a sea of oil. Today we are making the special fuels and lubricants to keep our airplanes flying, our ships sailing, our tanks and motor equipment rolling, and we are fueling the industrial life of the nation. We know we can handle this new scrap-rubber assignment also.

"Our facilities for gathering scrap rubber quickly through our farflung nation-wide organization are ideal and unique.

"Mr. President, the petroleum industry in America accepts your assignment with enthusiasm and will not fail you and the nation."

Industrial, governmental and civic organizations throughout the country combined their facilities this week for the 14-day scrap-rubber collection drive which, at midweek, was reported off to a flying start in every nook and cranny.

All hopes for automobile tires, other than the most essential, during the next 2 years or more, hinge on the success or failure of the campaign. Even success will not assure nonessential cars of retreads, recaps or new tires but it would improve the outlook over the predrive prospects.

from the smallest filling station to the largest company to launch at once an all-out drive for the collection of reclaimable scrap rubber for the Government. The importance of this move is so great that I do not hesitate to ask that every petroleum organization in the country assign its personnel and particularly its sales forces to the prosecution of this drive, and to employ the plant and transportation facilities of the industry in this undertaking.

" 'It is vitally important that every retail outlet and bulk plant be advised definitely of this plan, requested to provide or borrow emergency weighing equipment, directed to pay 1 penny a pound for the mixed scrap rubber to all persons offering it, and that facilities be provided for transportation to bulk plants or other storage points. It is equally important that supplying companies and others in a position to do so offer financial guarantee to station operators and provide funds when needed. All of this should be accomplished before next Monday morning otherwise the tremendous impetus of the drive may be lost and the industry discredited.

" 'The state and local salvage committees of the Bureau of Industrial Conservation, War Production Board are prepared to cooperate with you. and I am telegraphing governors and mayors requesting that they support the drive and relax any laws or ordinances which might interfere.

" 'The drive now to be launched should be continued with the greatest vigor over the period from June 15 to June 30. I cannot too strongly impress upon the petroleum industry the vital necessity and the extreme urgency of this action.'

"You will understand that the oil industry will provide all facilities without charge and will pay over in equal shares to the national headquarters of the U.S.O., the Army Relief, the Navy Relief, and American Red Cross all sums received from Government in excess of actual disbursements for rubber scrap purchased.

"Your support of the campaign by public utterance and otherwise is urgently requested and I trust that any laws existing which might otherwise interfere with the collection, transportation, and purchase of rubber scrap by the oil industry may be relaxed for the period of the drive.

"Harold L. Ickes,
"Petroleum Coordinator for War."

Testing synthetic rubber to determine milling characteristics and other physical qualities is being pursued in scores of laboratories, preparing for the time when the oil industry's refineries will attain peak production

Entire Industry Enlisted

Coordinator Ickes wired the oil companies that the Rubber Reserve Co. has given public assurance that it will purchase mixed scrap rubber from the oil industry at a price of $25 per short ton in car-load lots, at point of shipment.

He added that he had been assured by representative groups of the oil industry that it is able and willing to receive this rubber scrap, pay service stations a penny a pound for it—or exactly the cost to the stations—and to sell the rubber, in turn, to Rubber Reserve. The difference in the price paid service stations and that received by the industry from Rubber Reserve will be donated by the industry to the United Service Organizations, Army Relief, Navy Relief, and American Red Cross.

Companies were requested by the coordinator to keep careful nonduplicative accounts of all rubber purchased and to forward these to state chairmen of the petroleum industry scrap-rubber drive committees. The drive chairmen will report in turn to the chairmen of the appropriate petroleum industry general committees in the five districts comprising the nation.

The following is the text of telegram sent by Coordinator Ickes to the oil companies:

"President Roosevelt has directed that an all-out, nationwide scrap-rubber salvage campaign begin at 12:01 A.M. Monday, June 15, and continue until midnight on Tuesday, June 30.

"One of the most critical material shortages which this country must overcome to win the war is the shortage of rubber. And one principal means of meeting this shortage is through the collection and reclamation of scrap rubber throughout the nation. There is a very large tonnage of scrap available over the country and facilities for its reclamation exist. It remains only for us to collect this scrap material.

"In keeping with the president's wish and in collaboration with the Industrial Conservation Bureau of the War Production Board which has delegated responsibility for the petroleum industry's activities in this drive to the Office of the Petroleum Coordinator for War, I call on you as I am calling on every unit of the oil industry from the smallest filling station to the largest company to launch at once an all-out drive for the collection of reclaimable scrap rubber for the Government. The importance of this move is so great that I do not hesitate to ask that every petroleum organization in the country assign its personnel and particularly its sales forces to the prosecution of this drive, and to employ the plant and transportation facilities of the industry in this undertaking. Details of the program have been transmitted to you through the offices of Mr. Boyd, chairman of the Petroleum Industry War Council.

"Rubber Reserve Co. today gave public assurance that it will purchase mixed scrap rubber from the oil industry at a price of $25 per short ton in carload lots, point of shipment. I was assured on June 6 by representative groups of the oil industry that it is able and willing to receive such rubber scrap, pay a penny a pound for it, and sell it to Rubber Reserve, donating the difference to the charities mentioned in Mr. Boyd's communication.

"It is vitally important that every retail outlet and bulk plant be advised definitely of this plan, requested to provide or borrow emergency weighing equipment, directed to pay 1 penny a pound for the mixed scrap rubber to all persons offering it, and that facilities be provided for transportation to bulk plants or other storage points. It is equally important that supplying companies and others in a position to do so offer financial guarantee to station operators and provide funds when needed. All of this should be accomplished before next Monday morning otherwise the tremendous impetus of the drive may be lost and the industry discredited."

Removal of any obstacles which interfere with the president's scrap rubber collection drive was urgently requested of the governors of each of the 48 states and the mayors of cities today by Petroleum Coordinator for War Harold L. Ickes.

In telegrams sent to each governor and to the mayors of all cities of 50,000 population and over, the coordinator said:

"Your support of the campaign by public utterance and otherwise is urgently requested and I trust that any laws (and ordinances) existing which might otherwise interfere with the collection, transportation, and purchase of rubber scrap by the oil industry may be relaxed for the period of the drive."

The all-out, nationwide scrap rubber campaign ordered by the president begins at 12:01 A.M., Monday, June 15, and will continue until midnight on Tuesday, June 30. A penny a pound will be paid for all rubber turned in at service stations during the drive, which is being conducted through the Office of Petroleum Coordinator for War by the petroleum industry.

Full Facilities Solicited

Telegrams also were addressed by the coordinator to each of several hundred oil companies the nation over, requesting that they assign their entire organization—including personnel, plants, and transportation facilities—to the successful prosecution of the drive.

The following is the text of the telegram sent by Coordinator Ickes to the governors and mayors:

"President Roosevelt has ordered an intensive 2 weeks' drive throughout the nation to bring in from homes, offices, factories, and farms, all articles of rubber which have been or can be discarded, the same to be purchased by the oil industry at a penny a pound and resold to the Government. In this connection I have telegraphed the heads of oil-industry units throughout the nation as follows:

" 'In keeping with the president's wish and in collaboration with the Bureau of Industrial Conservation of the War Production Board which has delegated responsibility for the petroleum industry's activities in this drive. to the Office of the Petroleum Coordinator for War and through it to the industry, I call on you as I am calling on every unit of the oil industry from the smallest filling station to the largest company to launch at once an all-out drive for the collection of reclaimable scrap-rubber for the Government. The importance of this move is so great that I do not hesitate to ask that every petroleum organization in the country assign its personnel and particularly its sales forces to the prosecution of this drive, and to employ the plant and transportation facilities of the industry in this undertaking.

" 'It is vitally important that every retail out let and bulk plant be advised definitely of this

plan, requested to provide or borrow emergency weighing equipment, directed to pay 1 penny a pound for the mixed scrap rubber to all persons offering it, and that facilities be provided for transportation to bulk plants or other storage points. It is equally important that supplying companies and others in a position to do so offer financial guarantee to station operators and provide funds when needed.

" 'The state and local salvage committees of the Bureau of Industrial Conservation, War Production Board are prepared to cooperate with you, and I am telegraphing governors and mayors requesting that they support the drive and relax any laws or ordinances which might interfere.

" 'The drive should be continued with the greatest vigor over the period from June 15 to June 30. I cannot too strongly impress upon the petroleum industry the vital necessity and the extreme urgency of this action.' "

Payments Arranged

Coordinator Ickes wired the oil companies that the Rubber Reserve Co. has given public assurance that it will purchase mixed scrap rubber from the oil industry at a price of $25 per short ton in carload lots, at point of shipment.

He added that he had been assured by representative groups of the oil industry that it is able and willing to receive this rubber scrap, pay service stations a penny a pound for it—or exactly the cost to the stations—and to sell the rubber, in turn, to Rubber Reserve. The difference in the price paid service stations and that received by the industry from Rubber Reserve will be donated by the industry to the United Service Organizations, Army Relief, Navy Relief, and American Red Cross.

Results To Be Tabulated

Companies were requested by the coordinator to keep careful nonduplicative accounts of all rubber purchased and to forward these to state chairmen of the petroleum industry scrap-rubber-drive committees. The drive chairmen will report, in turn to the chairmen of the appropriate petroleum industry general committees in the five districts comprising the nation.

"Careful nonduplicative accounts of rubber purchased should be forwarded to the state chairmen of the Petroleum Industry Scrap Rubber Drive Committees who will report to the five district general chairmen.

"The state and local salvage committees of the Bureau of Industrial Conservation, War Production Board are prepared to cooperate with you and I am telegraphing governors and mayors requesting that they support the drive and relax any laws or ordinances which might interfere.

"The drive now to be launched should be continued with the greatest vigor over the period from June 15 to June 30. I cannot too strongly impress upon the petroleum industry the vital necessity and the extreme urgency of this action."

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Permanent Rationing Plan For Eastern Area Adopted

WASHINGTON, D. C.—Details of the permanent gasoline-rationing plan to go into effect in the eastern region July 15 have been announced by the Office of Price Administration.

Whether or not the plan will be extended to the entire nation is still an undecided matter of administration policy and may depend, in large measure, on the results of the current scrap-rubber collection drive, since its sole purpose, outside of areas of actual gasoline shortage, would be to conserve tires.

Originally scheduled to go into effect July 1, the new plan was postponed 2 weeks to give local rationing boards and OPA field staffs more opportunity to prepare for its administration. Meanwhile, the present "meal ticket" ration cards will be good until July 1, and the unit value of each of their coupons has been increased from 3 gal. to 6 gal.

Full details have not yet been announced, including the boundaries of the eastern rationing area. At present the ration area excludes many western portions of the 17 states in District 1 of the Office of Petroleum Coordinator.

The new system is based on a book of 48 coupons issued to each motorist and good for 1 year. The unit value of each coupon is not stated, and may vary from time to time or place to place, but it had previously been announced that each coupon would be good for the purchase of 4 gal. of gasoline.

In announcing that the plan would become effective July 15 the OPA issued the following explanatory information:

First copies of the new "A" gasoline coupon book, which motorists in the East Coast rationed area will need to obtain their basic rations of gasoline when the coupon plan goes into effect in July, were delivered last week to the OPA.

The book, which will fit into a wallet or a vest pocket, contains six sheets of eight coupons each. These 48 coupons represent a year's supply of gasoline for the holder.

Each sheet of coupons will be good for a 2-month period. The eight coupons of the first sheet are marked "A-1" which means that they may be used at any time during the first 2 months after the plan goes into effect. Coupons on the following sheets are numbered "A-2," "A-3," etc., and will be good during the respective 2-month periods.

The coupons may be accumulated within the several periods, but unused coupons are void after the period for which they were issued is over.

Transfer Made Difficult

On the outside of the front cover, the book will carry a description of the car for which the book is issued, as well as the name and address of the owner. Service-station attendants will be directed to honor the book only for gasoline delivered into the tank of the car described on the book.

Instructions, appearing inside the front cover, warn holders against tearing out the coupons and presenting them loose at a service station. The attendant is expected to detach the coupons himself, to make sure that the coupons were issued for the car that he is serving.

The other coupon books to be used in the plan will resemble the "A" book, except in color of the printing, and number of coupons.

The "A" books, printed in black, will be available to every registered automobile owner. "B" and "C" books, which provide supplemental rations, will be printed in green and red, respectively. "D" books, which are for motorcycles, will be in blue; the "S," which is for trucks, buses, etc., will be brown; and "E" and "R" books, for nonhighway uses, will be orange and purple, respectively.

The "A" books may be obtained at time of registration. All other books must be applied for at a local rationing board.

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Increased Barge Movement Aim of New OPC Committee

WASHINGTON, D. C.—Immediate increase in barge movements of oil on the inland waterways—to help meet the requirements for fuel oil and gasoline in the Atlantic seaboard area—was called for last week by the Office of Petroleum Coordinator.

In a formal recommendation (No. 51 of the OPC) issued to the oil industry, a joint barge subcommittee is authorized to suggest methods of obtaining the maximum efficiency in the use of all inland-waterways barge equipment employed, and to assure that all such equipment is utilized to meet the critical problems of petroleum supply.

The subcommittee is given wide latitude in its methods of approaching the problem. The recommendation calls for two broad measures:

First: Surveys and investigations to obtain complete information concerning the "use, location, port-to-port movement, and availability of inland-waterways barge equipment."

Second: The presentation of a plan to utilize present equipment most advantageously and to obtain new or converted equipment from other available sources.

The joint barge subcommittee will consist of two men each from the Atlantic seaboard, Mid-Continent, and Gulf Coast areas (Districts 1, 2, and 3). Walter DuMont, OPC's district director of transportation, will act as adviser and consultant with the subcommittee.

Appointments to the subcommittee will be made by the industry chairman of the transportation committee for each district, subject to approval by the petroleum coordinator or the deputy coordinator.

The plan to speed up barge movements by rerouting, or whatever other methods are suggested, will be submitted for approval to the chief counsel of the Office of Petroleum Coordinator. Upon approval by OPC, the subcommittee will be authorized to take the measures necessary to carry out the provisions of the plan.

Dunn-Mar Company Buys Ohio Producing Properties

The Dunn-Mar Oil & Gas Co. of Washington, Pa., recently completed the purchase of 64 oil wells from the Ohio Producing & Refining Co., a subsidiary of the East Ohio Gas Co. The acreage acquired consists of 3,193 acres in Guernsey, Holmes, Wayne and Knox counties, Ohio. The present daily average production from these properties is 120 bbl.

Since the first of the year the Dunn-Mar company has acquired, in addition to the above, the properties of the Consolidated Oil & Gas Co. and the Moore-Tex Corp. involving 800 acres and 28 producing wells in Monongalia County, West Virginia. A late purchase in 1941 included 16 wells in Allegheny County, Pennsylvania. The company now owns and operates about 300 wells with annual production of 105,000 bbl.

Edward Martin, president of Dunn-Mar, is better known as Gen. Ed Martin, the present Republican nominee for governor of Pennsylvania. Stewart M. Vockel, Pittsburgh refiner, is treasurer of the company.

STATE CAPITALS...

ILLINOIS

ONLY "A FEW REQUESTS" for exceptions to the rule limiting the drilling of one oil well to 40 acres have been filed by Illinois operators, and a limited number of exceptions have been granted, Wirt Franklin, head of the Chicago OPC office, said last week.

From another source, it was learned there had been a "great many requests filed for exceptions" and that the Washington office was "easing down" on the drilling rule. Mr. Franklin's office said that in some pools surveys are being made to make the rule one well to every 20 acres. The office said no word of definite action had been received in Chicago.

Robert M. Medill, director of the state Department of Mines and Minerals, has urged all Illinois operators to send requests to the state Division of Oil and Gas Conservation as soon as possible.

Mr. Medill stressed the necessity of filing exceptions "for pools capable of the greatest sustained production with a maximum use of steel. This will be the yardstick by which these applications for exceptions will be measured. There will be no hard, fast rule limiting exceptions to depths of 1,500 ft. and 2,500 ft., providing operators can offer proof that more production can be obtained from sand formations, of long life and with a minimum use of steel."

New spacing requirements, Mr. Medill said, will be "one well to 10 acres to a total depth of 1,500 ft.; one well to 20 acres to a total depth of 2,500 ft.; such spacing shall apply to sand producing formations only; in spacing one well to 20 acres, one of the two wells in the 40-acre unit may be drilled to any deeper formation below 2,500 ft. and produced as a multiple completion; it is desired that the pattern to be followed for two wells on a 40-acre tract be diagonal, namely: northeast-southwest or northwest-southeast."

APPOINTMENT OF FIVE MEMBERS of the board of natural resources and conservation in the state Department of Registration and Education has been announced by Gov. Dwight. H. Green. They are Dr. Robert Adams and Prof. William Trelease, University of Illinois; Prof. Edson S. Baston and Prof. Ezra J. Krause, University of Chicago, and Louis R. Howson, Chicago.

CALIFORNIA

CALIFORNIA OPERATORS are casting ballots for members of the Conservation Committee of California Oil Producers, official curtailment body for the District 5 production committee. Organization will probably be completed later in June when the regular meeting is held to establish allowable production for July. No great change is expected although the segregation of some fields and establishment of new districts may change representation to some extent. The classification of some fields as stripper pools in which no curtailment of production is expected has simplified administrative work and permitted operators to devote all their time to the production of heavy crude oil.

CALIFORNIA OIL ALLOCATION schedules for June were mailed to all operators for their information and sent to the Office of Petroleum Coordinator last week for approval.

The schedules allocate a net total of 653,000 bbl. daily of crude production, out of a total of 691,900 bbl. daily for crude oil, condensate and natural gasoline established by the coordinator.

For May the crude-oil allocation was 635,800 bbl. per day, out of 673,800 bbl. per day for all petroleum liquids for that month.

TEXAS

WEEKLY REPORTS on petroleum stocks in Texas are required by an order issued last week by the Railroad Commission. Reports are required from all concerns holding 10,000 bbl. or more petroleum in storage which will give the commission, its engineers believe, more detailed data than has ever been assembled in the past.

The weekly reports will be required by the commission for the purpose of making allowable adjustments that may be dictated by rapidly changing conditions. Results of allowable orders will be reflected much more rapidly with a weekly check on stocks, the commission believes. Reports will show where stocks are increasing, where withdrawals are excessive and, in general, give the regulatory body a clearer picture of how accurately purchaser nominations check with demand.

April and May proration orders in Texas, according to an analysis released in Austin last week by Olin Culberson, railroad commissioner, did not add materially to stocks of oil, the net gain over the 2-month period being 528,000 bbl.

"The total estimated crude-oil production for the months of April and May," Mr. Culberson declared, "was 74,958,244 bbl. This exceeded the recommendation of the Office of Petroleum Coordinator for the 2 months by 11,178,244 bbl. Crude-oil stocks, as reported by the U. S. Bureau of Mines, show that on April 4 the total stocks of Texas crude oil were 96,918,000 bbl., and as of May 30 the total stocks were 97,446,000 bbl., an increase of only 528,000 bbl. during this period.

"It would, therefore, appear," he concluded, "that the Office of Petroleum Coordinator's estimates for the months of April and May were more than 10,500,000 bbl. short of the actual demand for these 2 months."

ALLOWABLE PRODUCTION for the last half of June was reduced to 1,190,322 bbl. daily, a cut for the state of 59,466 bbl. Crude production for the last 15 days is expected to be around 1,111,340 bbl., while condensate and natural-gasoline output will be about 98,000 bbl.

Indicated production of all oils during the last half of this month will be 1,209,340 bbl. daily, or 141,340 bbl. more than Coordinator Ickes recommended. Practically all of the cut in allowable was made in East Texas where the commission said stocks were increasing too rapidly. Eight producing days were authorized in East Texas out of the last 15 days this month. Other fields of the state were placed on a 10-day producing schedule.

KANSAS

THE MARKET-DEMAND hearing for July will be held at Wichita June 26, the Corporation Commission announced last week in calling for purchaser nominations covering requirements next month. The commission will hear market-demand testimony for the Hugoton gas field at that time.

Producers Consider Plan For Scrapping Service Derricks

OIL producers this week considered the suggestion made in Washington, D. C., that steel derricks standing over oil wells and used primarily for servicing operations might be scrapped to further the general metal-salvage program without making committments. The suggestion did not inspire spontaneous support, although most producers indicated willingness to make the sacrifices involved if necessary and if replacement well-service equipment is made available.

The suggestion that steel derricks could be scrapped was made by M. R. Singleton, salvage director of the petroleum industry for the Industrial Salvage Section of the Bureau of Industrial Conservation, War Production Board.

Most of the oil wells in this country, according to Mr. Singleton can dispense with fixed derricks by using itinerant truck-drawn hoisting equipment. There was general agreement with Mr. Singleton's conclusion but, it was pointed out, new steel would have to be made available in a certain number of masts to replace the scrapped derricks, if operations are to be maintained at present efficiency.

By scrapping useless derricks in Oklahoma, Kansas, Texas, and California, more than 300,000 tons of steel could be directed into essential war production, Mr. Singleton contended before the Petroleum Industry War Council to which he originally made the suggestion. Officials of the Bureau of Industrial Salvage estimate that Oklahoma can scrap 15,900 derricks; Kansas, 11,800; North Texas and the Panhandle, 3,800 and East Texas, 10,000.

"In searching for additional metal scrap," said Mr. Singleton, "we should certainly not overlook the potential scrap in derricks standing in oil fields where it is possible to operate without them. Three months ago, the petroleum industry began its salvage campaign. So far it has collected and moved back to the mills about 335,000 tons of iron and steel scrap, and 16,000 tons of nonferrous metals. Indications are that a harvest of these derricks should realize an equal amount."

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

Support the Drive

The petroleum industry through its representatives in Washington was largely responsible for the drive to collect scrap rubber. More than any other industrial group at the nation's capital, they have realized the seriousness of the rubber shortage in the war economy. For weeks they have endeavored to get action which would determine accurately just what stocks and demands are and what must be done to assure adequate supplies.

The scrap-rubber drive is the beginning in getting the correct answer to several questions. The quantity of rubber that can be reprocessed into finished products will largely determine how many cars, trucks, and buses will be on the highways and streets over the next 2 years, the minimum period required to complete the construction programs looking to the production of 800,000 or more tons of synthetic rubber.

There has been no accurate way of determining the quantities of used rubber in the hands of consumers. Estimates have varied from 100,000 to more than three million tons.

If a minimum of a million tons of reclaimed rubber can be obtained over the next 24 months, including the sizable quantity already on hand, there is reason to believe that severe restrictions in civilian use can be avoided with all military requirements fully covered. It should be kept in mind in this connection that a large part of the rubber that can be made available is now in tires which still have from a few hundred to many thousands of miles to go before they are ready for the scrap pile. The collection of scrap must be a continuing operation.

An investigation by a committee from the petroleum industry which played a part in the decision to carry on a scrap drive at this time, revealed that 80 per cent of the 27 million passenger cars could be kept in service until the latter part of 1944 through recapping with 300,000 tons of reclaimed rubber plus a small quantity of new rubber. With a million or more tons of reclaimed material during that period, sufficient new and reclaimed rubber would remain for military and lend-lease requirements which have first consideration.

This, of course, does not mean the normal use of cars by civilians. It does mean that all of the so-called essential needs of trucks and buses, transportation to industrial plants in private cars, and the uses of agricultural equipment will be fully provided for. Furthermore, there will be sufficient rubber left to take care of most of the demands of millions of other users.

A return to 1917 methods in transportation is no more possible in civilian activities than it is on the battlefields. The fact that this country shortly will be able to produce more of certain war equipment and goods than all of the rest of the warring nations combined, springs basically from the fact that its citizenship has had the full use of motor power. That power which in the past has been employed in the establishment of a better standard of living, is now directed everywhere toward winning the war.

The petroleum industry through its thousands of stations at the corners and the crossroads, has been made the collection agency in this rubber drive. It may develop that the campaign should have been preceded with more publicity as to what is needed and why.

The main point is that a start has been made. Revisions in collection plans incorporating suggestions offered by the petroleum industry's representatives can come later. The big job now is to quickly complete the initial inventory of scrap stocks which can be turned into usable rubber.

Oil operators in every branch of the industry, and their associations, can well afford to devote a large part of their time in seeing that every piece of unused rubber is part of the scrap heap within the next 2 weeks.

Transport Is Keynote in Rival Strategies in Oil

By H. G. AUSTIN
Member Institute of Petroleum, London

This analysis of oil strategy in current stages of the war is based on a broad background of international petroleum affairs, acquired by the author through 23 years' experience with one of the leading American supply companies.

During the past several years, Mr. Austin has been stationed in England and in eastern Europe where he had a ringside seat at preliminaries culminating in the economic conquest of Rumania and the preinvasion sparring between Germany and Russia.

EVENTS of the past few months have revealed the plans of the Axis powers' strategy in regard to oil. The keynote is not—as so many writers would have us believe—the gaining of new sources of supply of oil—but the denial of oil to the Allied Nations by Axis seizure of strategic oil-producing areas, and strenuous efforts to disrupt the flow of oil supplies over the vast ocean distances from the sources of supply to the far-flung fighting fronts.

Strategy of the Allies in regard to Axis oil has been plain, for some time. From the start of the war, the British and French fleets endeavored to set up a blockade to prevent Germany from receiving oil from any overseas sources. This strangle-hold was never complete, mainly due to the fact that Italy, before Mussolini declared war, was permitted to receive quantities of oil products, most of which were immediately transferred to Germany. Spain, under obligations to the Axis for assistance during the civil war in that country, also acted as a channel for oil supplies, particularly after the French capitulation.

One source of supply to the Nazis could not be stopped, and that was the oil sent by Russia to Germany under the temporary agreement between those countries, when each was playing for time in which to make preparations for the inevitable conflict. The quantity of Russian oil supplied, however, was less than 1,000,000 tons (7,500,000 bbl.) per year, but this was an important contribution, when it is considered that the estimated Nazi production, from all sources today, is around 12,000,000 tons yearly, or less than 90,000,000 bbl.

Rumania acted as the main supply base for oil to Germany, and when war broke out in September 1939, the French and British economic missions in Rumania swung into immediate action.

Every available oil barge and tug on the Danube was either bought outright or chartered by the Allied missions, and competitive bidding sent the price of all oil products in Rumania up to three times the levels prevailing in August 1939. The position became so stringent that the Nazis were forced to take action in the late fall of 1940 by marching into Rumania and taking over intact the great oil industry of that country. This seizure of an annual crude output of nearly 6,000,000 tons (45,000,000 bbl.) per year, together with refinery capacity of over 30,000 tons (225,000 bbl.) per day, solved the problems of an impending oil shortage with which the Nazis were faced. Plans for the 1941 campaigns against the Balkans and Russia could not have been carried through without Rumanian petroleum under complete control.

During 1940, the R.A.F. carried out determined attacks on many oil refineries, synthetic-oil plants, and storage installations, in Germany and Axis occupied countries, the British aircraft ranging as far from their home bases as Regensburg, the Nazi distributing center on the Danube for Rumanian and Hungarian oil products. The results of the R.A.F. attacks on oil targets were not very conclusive, however, as is shown by the abrupt switching of bombing by the British to other targets, especially railroad yards, and other transport facilities upon which the Nazis had mainly to rely for the carrying of coal and other raw materials required for their synthetic-oil plants, and for the passage of the many trains of oil tank cars carrying the loot from Polish, Hungarian, and Rumanian oil fields, to industrial and military areas throughout western Europe.

In passing, it is to be noted that the 1940 attacks by the R.A.F. were not carried out with the high-blast bombs now in use. The attacks by the Russians on the Rumanian oil refineries at Ploesti in the fall of 1941 were not successful, again owing to the type of bomb used.

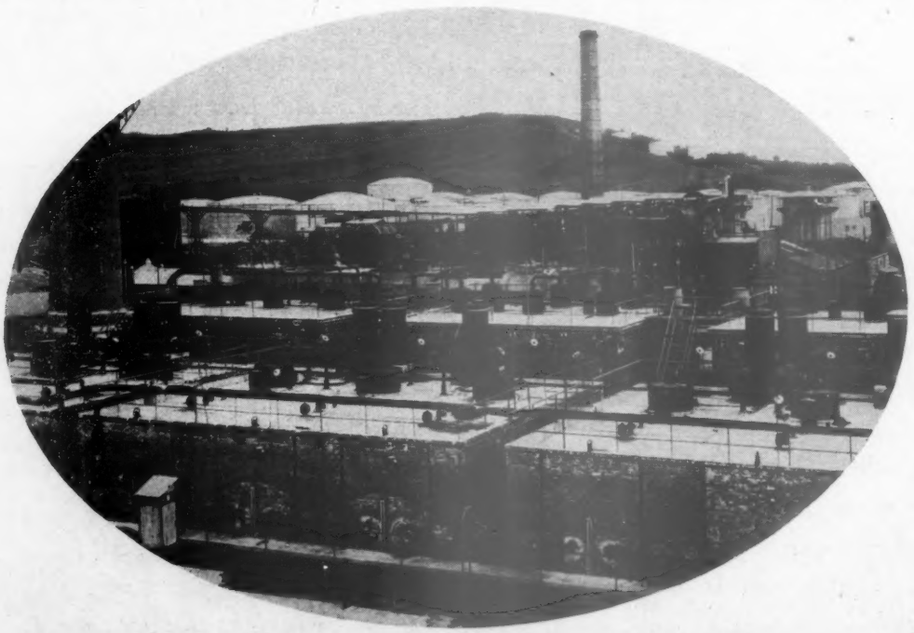
Transport Objective of Allies

The concentration of bombing attacks on Axis transport, in place of attacks on actual oil targets, seems to have had a considerably greater effect, and it is along these lines that Allied oil strategy in 1941 and 1942 has been promulgated.

With the commencement of the Nazi campaigns of 1941 in the Balkans, and in Russia, the importance of the focal point of oil supplies from Rumania was better understood. In spite of the difficulties presented by the mountainous country in Bulgaria and Greece, the Nazis oil-transport system functioned, being based on the Rumanian port on the Danube, Giurgiu, to which point two small-diameter pipe lines were laid from Ploesti, to supplement the existing lines between the Rumanian refining center and the principal oil port on the river.

From Giurgiu, oil supplies were shipped down through Bulgaria, and also up river to Hungary, Czechoslovakia, and Austria, from which points the Nazi offensive on Yugoslavia was launched.

The accumulated oil reserves for the onslaught against Russia were mainly from Rumania, although the poor transport facilities, comprising a single-track railroad from Ploesti through Transylvania to Czechoslovakia and Poland, offered some difficulties. The occupation of the Ukraine and of the northern shores of the Black Sea enabled the Nazis to use the single-track railroad from Ploesti through Cernowitz to former Poland, this line also branching off to the Danube ports of Braila and Galatz. These ports, together with Constanza, on the Black Sea, gave valuable supply lines to the southern fighting fronts in Russia, although the number of tankers, barges, and tugs, available for this vital route was inadequate, due to lack of sufficient river craft for the important Danube transport link with Central Europe. It is not generally known that the British, warned of the approaching German move against Rumania, took all craft, owned by the Allies, out



One source of Nazi petroleum products is this refinery in the northern part of Rumania where output is virtually exclusively devoted to German military operations

of the Danube to Turkey, disposing of them in that country.

The fall of Greece and Crete opened up a further important water route from Rumania via Constanza, through the Dardanelles, to all Axis areas in the eastern Mediterranean and in Italian waters, but Allied submarines took effective countermeasures, and sank a considerable proportion of the few remaining Italian and Rumanian tankers available for the easing of the existing transport bottlenecks on the Danube and overland routes from Rumania.

To appreciate the transport difficulties of the Nazis in the movement of vital oil supplies in Europe, it is interesting to study Rumanian statistics for 1941. The figures available seem to be accurate, and the crude output of 5,100,000 tons in 1941 reflects the steady decline in production. With ample refining capacity available, it is to be presumed that only refined-oil products were taken by the Nazis, and the fact that exports in 1941 amounted to 3,200,000 tons shows that although production of crude in Rumania is well below the maximum possible figure, lack of transport facilities prevents the Nazis from making full use of this important contribution to total Axis supplies, estimated to be around 12,000,000 tons per annum.

Western Line Uncertain

Efforts to lay a 12-in. pipe line from Ploesti westward through Tirgoviste to Moldova Noua, on the Danube, above the bottleneck of the Iron Gates, do not seem to have succeeded, as the resultant saving in round-trip time of the restricted number of river tugs and barges available would surely have increased the export figure for 1941. The pipe-line project was scheduled for completion by April 1941.

To sum up the Allied balance sheet, bombing of oil targets proved ineffectual, but attacks on transport routes, both on land and sea, by R.A.F. bombers and Allied submarines in the eastern Mediterranean, have increased the Nazis' difficulties in moving the available oil, even from Rumania, which served as a central point—the geographical importance of which cannot be overstressed—during the year of the greatest military achievements by the Axis.

Documents found in Libya and Russia are reputed to have indicated that the Axis mechanized forces received definite instructions to economize in consumption of oil products—clearly proving that transport facilities for oil supplies were not adequate.

Axis propaganda, to the effect that the seizure of the Caucasus would result in all wells being back on production within 90 days of the occupation of the strategic oil fields of that area, bears no relation to the facts. With 8 years of recent experience in the oil fields of eastern Europe, the writer can state that the Germans cannot produce drilling and production equipment with which to exploit very promising areas in Rumania, and cannot arrest the rapid decline in production in that country. The Nazis realize that efforts by European manufacturers—for many years past—to turn out good oil-field equipment have failed.

The fact that a substantial surplus of oil products had to be left in Rumania—due entirely to lack of transport facilities—probably helped to define the oil strategy of the Axis.

It was only the stubborn resistance of the Russians, aided considerably by the lengthy siege of Odessa, that prevented the Germans from wintering in the Caucasus in 1941-42. The loss of the Caucasian oil fields would have been a severe blow to the Russians, but it would not have eliminated their oil supplies, since so many new areas, particularly in the Ural-Volga region, have been developed, with sufficient refinery capacity available to meet military and domestic requirements. But the loss of the Caucasus, with the intricate and well-planned transport routes by pipe line, railroad, and waterways, would have damaged the oil-transport organization of the Soviets. It is unlikely that the Nazis will attempt a drive to the Caucasus this year, and if such an attack is made, the principal object will be to cut the supply line from the Persian Gulf—certainly not with the aim of gaining new oil supplies. The denial of the Caucasian oil supplies will not be a crippling blow to Russia, since transport facilities for oil from the Ural-Volga areas to industries and fighting fronts must, by now, be adequate.

It is possible that attacks, via Turkey and Libya, may be made with the aim of cutting off the Allied supplies of oil from Iraq and Iran—now vital to all the Middle East and Indian theaters of war.

Asiatic Supply Is Problem

The Japanese, by seizure of the vital East Indian islands, from which so much oil was produced, and by a swift advance into Burmah, have increased the Allied problems of oil supplies to Oceania, and to the Chinese.

The East Indian oil fields were all owned by international oil companies, the technical staffs of which were able to prepare—well in advance of Japanese attacks—a complete plan of demolition. Except for a few shallow-producing horizons, now exhausted, the Japanese can gain no fresh supplies of oil by their conquests. Their main oil problem—like that of western Axis partners—is one of transport, and this problem consists of shipment by tanker from reserves in Japan.

The loss of Burmah now means that oil supplies for China can come only by a long land route from Russia, unless a new link from India can be forged to enable shipments of oil from the Abadan refinery, at the head of the Persian Gulf, to be made over the great distances involved.

Australia and other Pacific fighting zones, with the loss of sources of supply in the Netherlands East Indies, must now draw their oil from the Pacific Coast of the United States, a route involving the use of tankers over long distances.

The Axis have learned a valuable lesson from their oil transport difficulties, and their strategy is obviously to deny to the Allies their oil fields close to present fighting areas, and to strike, by every means in their power, at extended tanker routes.

Axis Strikes at Distribution

With almost 90 per cent of the world's oil supply in United Nations' hands, lengthening oil supply lines is inevitable and the policy pursued by the Axis is to endeavor to place the Allies in the same position as their own—with plenty of oil in hand, but with restricted means of transporting it to the points where it is needed.

There have been many forecasts by innumerable well-informed public men of an Axis collapse due to an oil shortage.

It is obvious that neither side is in danger of being faced with a total lack of oil reserves, but the war will definitely be settled by the lack of oil products at the actual fighting fronts.

The Germans and Italians must get their oil supplies—except for the Lybian front—overland, harassed by constant air bombing attacks, and congested by other military traffic. The Japanese must serve their widespread forces by tanker shipments, and as yet, Allied submarines have not taken any great toll of this vital traffic.

But if the Allies are to take the offensive, it means that tanker losses, so far severe, must not only be replaced, but that many more tankers must be built to carry oil supplies over the distances from present sources to the many fighting areas. To get the tanker convoys safely to their destination, many more warships must be built and manned.

The oil war has resolved itself not into a struggle for fresh oil supplies, but into a strenuous fight to keep open the transport routes.

Cost and Price Adjustment Committee Given Approval

WASHINGTON, D. C.—Formal approval has been given by the Office of Petroleum Coordinator to the formation and functioning of the committee on cost and price adjustment of the Petroleum Industry War Council.

The committee was appointed in the middle of May by William R. Boyd, Jr., chairman of the council. Its chairman is J. D. Gill, a director of Atlantic Refining Co., and it held its first formal meeting in Washington June 1 in connection with the monthly meeting of the PIWC. Permanent headquarters are being established in Philadelphia.

Formal approval of the committee and its operations was required by the procedure of the petroleum coordinator, and this has now been done through an amendment to OPC Recommendation 24, which created the PIWC.

Three principal duties are assigned to the committee:

It will investigate and report to the coordinator and to the Petroleum Industry War Council the effect upon petroleum supply of any changes in costs and prices in the oil industry.

It will prepare, at the request of either OPC or of the Office of Price Administration, economic analyses, facts, figures, or other data to be used in connection with cost or price proceedings under consideration by the OPA.

It will serve as a liaison committee between the PIWC and the committees of OPC on matters relating to petroleum-industry cost and price adjustments.

To carry out its duties, the industry committee is authorized to direct inquiries and questionnaires to whomever may have data required by the committee; to ask and receive expert assistance from any company, organization, or person; and to consult with any committees of the council.

Temporary district cost adjustment subcommittees may be appointed to conduct special studies in any of the five regions in the country.

Operating expenses of the committee, including the appointment of permanent or temporary staff members, will be borne by the Petroleum Industry War Council.

Consumption of Gasoline Rises Sharply in Canada

By W. V. HOWARD

CONSUMPTION of petroleum products, excluding lubricating oils, in Canada for the first quarter of 1942, shows an increase over 1941 of 13 per cent. Comparing the record of the first 3 months with the whole of 1941 and assuming the same ratio for the full year 1942, indicated consumption of petroleum products in Canada will total 61,837,000 bbl. this year, representing an increase of 15.9 per cent. The apparent discrepancy between this figure and 13 per cent is due to the variation in changes in demand in the different sections of Canada during the year.

To meet this demand, Canada produced 10,123,532 bbl. of oil in 1941 and during the first 5 months of 1942 production showed an increase of 8.8 per cent over the same period of last year. If this proportion is continued throughout the year, total production of petroleum in Canada will amount to 11,014,400 bbl. in 1942, or approximately 18 per cent of consumption.

Table 1, showing production of crude by months since January 1940, shows a healthy increase. This has come almost entirely from extensions to the Turner Valley field which is Canada's only major pool and accounts for more than 96 per cent of the country's output. Other Alberta fields add 1½ per cent and the remainder is distributed among Ontario, New Brunswick and the Northwest Territories. Production from the tar sands of the Athabaska is not included in this table as this oil does not come from wells but from mines. It accounted for some 17,000 bbl. in 1941 but production will probably be much greater this year.

Disregarding the variety of products required and the yield of these products per barrel of crude, Turner Valley cannot supply the indicated demand for the Prairie provinces in 1942.

Table 2 shows the variation in demand for the principal petroleum products by districts. Despite the imposition of rationing on the civilian use of gasoline in April 1941, there was an increase in demand for gasoline during the first 3 months of 1942 over the corresponding period of 1941 of 56.3 per cent in the Prairie provinces, 43.6 per cent in the Maritime provinces, 14.6 per cent in Quebec and Ontario and 8.5 per cent in British Columbia. The over-all increase in demand for gasoline in Canada is 23.6 per cent.

Considering the undoubted diminution of civilian use of gasoline, this increase indicates the importance of military consumption, much of which is probably due to the aviation training program which has assumed such great proportions in Canada.

The increase in demand for light fuel oil, which includes kerosene and tractor distillate is less than in the case of gasoline, being 9.2 per cent for the nation as a whole. British Columbia, which had the smallest increase in demand for gasoline, leads in increased consumption for light fuel oil with 16.4 per cent. The demand in the Prairie provinces is up 15.1 per cent, in Quebec and Ontario it is up 9.5 per cent and the increase in the Maritime provinces is negligible.

Heavy fuel oil meets with a diminished demand in the provinces bordering the sea, the decrease being 9.5 per cent for the Maritimes, and 6.9 per cent for British Columbia. Increased demand is shown by Quebec and Ontario (4.9 per cent) and the Prairie provinces (3.8 per cent). The net increase for Canada is 1.0 per cent.

Analyzing these changes in terms of refinery capacity, we find that British Columbia has an estimated demand in 1942 for 20,700 bbl. daily and refinery capacity of 43,400 bbl. The Prairie provinces have an estimated demand for 39,645 bbl. daily and refinery capacity of 38,450 bbl. The latter area will have to draw heavily on British Columbia refineries for gasoline and some heavy fuel oil but unless gasoline is imported, there will be a great increase in storage of heavy fuels in western Canada.

In the eastern half of the dominion, Ontario and Quebec have an estimated demand of 87,780 bbl. with refinery capacity of 134,900 bbl. while the Maritime provinces have an estimated demand of 20,755 bbl. and refinery capacity of 32,750 bbl. The demand for products of the refineries of Ontario and Quebec remains fairly well balanced but in the Maritimes it is thrown out of equilibrium by the large increase in demand for gasoline coupled with a reduction in demand for heavy fuels. The excess of the latter products cannot be absorbed by interchange with Quebec and Ontario as their increased demand can be met by stepping up the output of their own refineries to meet the increased gasoline requirements.

It appears, therefore, as if refiners on both Canadian coasts will have a large exportable surplus of heavy fuel oil and as they both must obtain their crude by tanker, one may see tankers returning from the refining centers to American ports with cargoes of heavy fuel oil.

TABLE 1—PRODUCTION OF PETROLEUM IN CANADA BY MONTHS

	1942 (bbl.)	1941 (bbl.)	1940 (bbl.)
January	875,659	802,652	476,111
February	850,397	737,313	644,849
March	922,999	849,706	559,394
April	850,761	822,166	624,132
May	*913,550	843,134	665,993
June	.....	818,000	646,602
July	.....	876,845	866,968
August	.....	870,881	858,155
September	.....	878,782	831,256
October	.....	871,491	807,100
November	.....	855,993	882,701
December	.....	883,083	727,717
Correction	.....	13,488	.....
Total	.....	10,123,532	8,590,978
Total 5 mos. ending May	4,413,366	4,054,971	2,970,479

*Estimated.

TABLE 2—CONSUMPTION OF PRODUCTS, JANUARY-MARCH (BARRELS)

	Maritime provinces	Ontario and Quebec	Prairie provinces	British Columbia	Total 3 months
Gasoline:					
1942	432,491	3,255,569	1,227,975	453,317	5,369,350
1941	301,136	2,839,837	785,856	417,682	4,344,511
Increase	131,355	415,732	442,119	35,635	1,024,841
Tractor distillate:					
1942	.....	.....	45,220	.....	45,220
1941	.....	.....	19,798	.....	19,798
Increase	.....	.....	25,422	.....	25,422
Light Fuel Oil:					
1942	354,281	1,567,596	155,214	309,689	2,386,780
1941	353,991	1,431,903	154,310	266,164	2,206,368
Increase	290	135,693	904	43,525	180,412
Heavy fuel oil:					
1942	857,057	1,228,988	283,194	987,717	3,356,956
1941	946,584	1,098,748	205,848	1,051,512	3,302,692
Increase	*89,527	130,240	77,346	*63,795	54,264
Total 1942	1,643,829	6,052,153	1,711,603	1,750,723	11,158,308
Total 1941	1,604,711	5,370,488	1,165,812	1,735,358	9,873,369
Increase	42,118	681,665	545,791	15,365	1,284,939
Per cent increase	2.6	12.7	46.8	0.9	13.0

*Decrease.

TABLE 3—CONSUMPTION OF PRODUCTS IN 1941

	Maritime provinces	Ontario and Quebec	Prairie provinces	British Columbia	Total
Gasoline	2,152,959	16,633,517	7,010,758	2,063,683	27,860,917
Tractor distillate	.....	.....	1,062,591	.....	1,062,591
Light fuel oil	1,423,167	4,775,921	694,850	1,011,825	7,905,763
Heavy fuel oil	3,999,245	7,020,091	1,088,856	4,412,546	16,520,738
Total products, 1941	7,575,371	28,429,529	9,857,055	7,488,054	53,350,009
Indicated demand, 1942	7,772,000	32,040,000	14,470,000	7,555,000	61,837,000

TABLE 4—PRODUCTION OF PETROLEUM BY FIELDS BY MONTHS IN 1942

	May*	April	March	February	January
New Brunswick	1,800	*1,600	1,877	1,524	1,747
Ontario	12,600	*12,400	12,659	10,821	11,628
Alberta:					
Turner Valley:					
Limestone	854,500	795,608	865,114	792,110	816,704
Gas wells	2,800	2,607	3,167	2,980	3,276
Absorption plants	26,000	24,337	29,748	30,340	32,121
Shallow	450	431	406	551	586
Red Coulee, light	900	844	899	755	959
Wainwright, heavy	2,500	2,119	1,299	1,163	1,196
Other fields	7,500	6,315	7,685	5,978	7,442
Total Alberta	894,650	832,261	908,463	833,552	862,184
Northwest Territories	4,500	*4,500	4,500	.....	.....
Total Canada	913,550	850,761	922,999	850,397	875,659

*Estimated.

House Committee Votes Higher Lubricants Tax

WASHINGTON, D. C.—The House committee on ways and means, framing a new revenue bill, voted last week to make no increase in the federal excise tax on manufacturers' sales of gasoline, but approved an increase in the tax on lubricating oil.

It was voted to raise the lubricating-oil tax, now 4 cents per gallon, to 6 cents. The Treasury Department had asked that it be raised to 10 cents.

The federal gasoline tax is now 1.5 cents per gallon and the Treasury had asked that it be increased to 3 cents, estimating, many months ago, that the higher rate would bring in revenue of $242,000,000 annually. Committee members said that because of rationing and curtailed motoring the gasoline tax would not yield as much revenue as had been anticipated, and that the higher tax would fall most heavily on farmers and non-highway users of gasoline.

The tax bill has yet to be reported to the House for action and may then be revised by the Senate.

War Production Problems to Receive Engineering Study

WASHINGTON, D. C.—American engineering societies will hold a series of war production conferences to exchange information which may be helpful in solving manufacturing problems in war plants.

Natural Gas News

New York Rate Increase Is Disallowed by FPC

WASHINGTON, D. C.—Proposed new rate schedules which would increase the price of natural gas purchased by the New York State Electric & Gas Corp. from New York State Natural Gas Corp. and the Keuka Construction Corp. and the price of natural gas purchased by Keuka from New York State Natural were disallowed last week by the Federal Power Commission.

According to the order, the two selling companies are affiliated with the Peoples Natural Gas Co. (from which New York State Natural purchases more than half of its gas requirements) through common control by Standard Oil Co. (N. J.) and through certain mutual officers and directors. After pointing out that no evidence was produced at hearings held March 16 and 18 and April 27, 1942, to show the investment in property, operating costs, or rate of return for Peoples Natural Gas Co., the order says: "Under Section 4(e) of the Natural Gas Act and our decision in the matter of Home Gas Co., Opinion No. 62, proponents of increased rates have the burden of establishing the justness and reasonableness of the cost of gas purchased from affiliates."

The increase in rate for gas purchased by New York State Electric & Gas was occasioned by proposed supplements to the contracts providing for the elimination of a special rate of 2.5 cents per therm for unaccounted-for gas (i. e. gas which is metered to the purchasing companies but for which they cannot account due to line losses and other factors). In lieu of the special rate, the proposed agreements provided that the purchaser would pay for unaccounted-for gas at the same rate as that which is received and resold from its facilities. The increase proposed by New York State Natural for gas sold to Keuka was merely an adjustment of income between the affiliates. It was estimated that elimination of the special rate from the present agreements would increase natural gas charges by New York State Natural to New York State Electric & Gas by $5,711 during 1942 and charges by Keuka to New York State Electric & Gas by $22,324 during 1942. Charges by New York State Natural to Keuka would be increased by $47,209 during 1942.

Natural-Gas Revenues Gain 13.9 Per Cent First 3 Months

NEW YORK.—Natural-gas utility revenues amounted to $193,273,700 in the first 3 months this year, or 13.9 per cent more than for the first quarter of 1941. Natural-gas utility sales for the period amounted to 524,395,400,000 cu. ft., an increase of 13.1 per cent.

Natural-gas sales for domestic purposes showed an increase of 15.5 per cent while industrial sales gained 8.8 per cent.

Natural Gasoline

Humble's Flour Bluff Plant Closed by Low Allowables

HOUSTON, Tex.—Reduction in allowables has resulted in cessation of operations at Humble Oil & Refining Co.'s 20,000,000-cu. ft. natural-gasoline plant in the Flour Bluff field, Nueces County, Texas. In the Benavides field, Duval County, Texas, Duval Gasoline Co.'s natural-gasoline plant is operating only 15 days out of each month due to reduced allowables. Arrangements have been made with Benavides field operators to shut in all wells possible and put others on smaller chokes for part of each month. Wells are opened at stipulated periods to produce the monthly oil allowable, resulting in sufficient gas to operate the plant 15 days.

Arkansas Plants Reduce Rate of Gas Processing

EL DORADO, Ark.—The eight natural-gasoline plants in southern Arkansas processed an average of 57,267,000 cu. ft. of gas daily during April, a decline of 6,015,000 cu. ft. from the average of 63,282,000 cu. ft. in March.

Daily production during April averaged 1,933 bbl. of natural gasoline, 532 bbl. of butane and 3 bbl. of condensate.

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Improvement Reported in Caribbean Tanker Traffic

NEW YORK.—Moderate but steady improvement is reported in the tanker situation in the Caribbean area allowing a proportionate relaxation in restrictions which were necessarily placed on crude-oil output and refinery operations in the Caribbean area due to submarine attacks. Field operations in Venezuela and Colombia are being well maintained, with limited quantity of new materials arriving under strict priorities and restricted cargo space.

A major campaign of exploratory development is expected to get under way in the coastal district of Colombia. Major oil companies are pursuing leasing activities both in Colombia and Ecuador with a view mainly to postwar development. Present exploratory activities in Ecuador are being confined mainly to the eastern trans-Andean portion of the country.

It is reported that the Pantepec Oil Co. of Venezuela holdings in eastern Venezuela are continuing to experience active development, especially in the Santa Barbara and El Roble districts. Three wells are said to be drilling at El Roble on jointly held Pantepec-Standard Oil Co. of Venezuela acreage. Pantepec's share in the output of its eastern Venezuela holdings is expected to reach 5,000-bbl. daily by August of this year.

California Group Organized To Promote Scrap Drive

LOS ANGELES, Calif.—The California oil and kindred industries have taken steps to avoid gasoline rationing if at all possible. At a general meeting in Los Angeles last week, Byron Hanna was elected permanent chairman of a group designated as the Drive for Victory Committee. The principal aim of the committee is an educational movement to promote slower driving, the collection of all salvable goods and a general study of the situation. Mr. Hanna told the organization group that "the destructive potentialities of gasoline rationing here have removed the problem from one of motorists to one of community-wide importance as our entire social and economic structure has developed on the use of the automobile."

A. L. Weil, former president of General Petroleum Corp. and now general counsel, declared that "no one knows the facts, no one knows how much reclaimable rubber there is in the country. There is a lot of political pressure on the president to ration gasoline and a lot of fellows in Washington take pleasure in imposing hardships on communities."

Petroleum Industry Among Few Remaining Exempt From PRP

WASHINGTON, D. C.—The petroleum and natural-gas industries are among the few business enterprises of this country which may continue to obtain materials after July 1 without resorting to the Production Requirements Plan. All but a few classes of companies requiring more than $5,000 worth of metal for the third calendar quarter of 1942 must apply for priority assistance under the PRP.

Only the following classes of companies using more than $5,000 worth of metal in the third quarter will continue under existing procedures instead of under the PRP: Petroleum enterprises, gas companies, producers of basic metals, distributors, wholesalers, builders, transportation companies, utilities, mining companies, and communications.

Conversion of the priority-assistance procedure to the PRP for approximately 3,000 companies not previously included will be stipulated in detail in Priorities Regulation 3 which is to be issued within a few days by the War Production Board.

All large metal users have recently been required to report their use of metal to the WPB on Form PD-275. Those affected by the revision of Priorities Regulation 3 may use exactly the same information in filling out PRP application Form PD-125A, adding the other data required.

As a result of this step, the WPB will be able to determine in advance of each quarter the total quantities of material required by industry. It will also obtain information as to available inventories in the hands of each manufacturer. With this information at hand, demand can be brought into approximate equality with supply, and the available supply will then be distributed in accordance with the established quotas.

While preference ratings will be assigned under PRP, the WPB will assign ratings only to delivery of the amount of material which it is estimated will be available during the quarter.

Extension of Preference Ratings to Be Simplified

WASHINGTON, D. C.—All preference ratings may be applied or extended after July 1 by a single form of certification, stating merely that the purchaser assures the seller and the War Production Board that he is entitled to use the rating indicated on his purchase order.

This simplified and standardized method of applying preference ratings is provided in an amendment to Priorities Regulation 3 which was issued on June 12.

Provisions of existing orders which require a purchaser to furnish his supplier with copies of preference-rating orders or other special certifications are all rescinded, except for the special provisions of Priorities Regulation 9 with respect to the application of preference ratings for certain types of exports. This change does not, however, affect any provision of existing preference-rating orders which limits the kinds of material which may be obtained by use of the assigned rating, or which requires specific information on purchase orders.

In addition to the standard certification, orders on which a preference rating is applied or extended after July 1, must also include the identification symbols required by Priorities Regulation 10, which established the allocation-classification system.

The amended Regulation 3 restricts extension of preference ratings, in most cases, to material which will be delivered to, or physically incorporated in a product delivered to the person to whom the rating was originally assigned, or which will be used to replace in inventory materials so delivered, subject to definite limitations. A rating may not be extended to replace materials in inventory except to the extent necessary to restore the inventory to a practicable working minimum. No rating higher than A-1-b may be assigned to orders for replacement of materials in inventory, even though the order for which the materials were used may have carried a higher rating.

A "basketing" provision permits the simultaneous extension of ratings which have been assigned by different preference-rating certificates or orders on a single purchase order. When ratings are basketed in this way, the lowest rating may be extended for the whole order, or the various items in connection with which the ratings are extended may be listed separately, with the corresponding rating applied to each.

Special provision is made for small manufacturers not operating under the Production Requirements Plan. Such producers may extend ratings to deliveries of operating supplies including lubricants, small perishable tools, etc., which are required and will be consumed in filling the rated order which they are extending, but the cost of such operating supplies must not exceed 10 per cent of the cost of the materials to which the rating is extended and which such supplies are used to process. Not more than 20 per cent of the operating supplies obtained in this way during any month may be metals in the forms described in the metals list of Priorities Regulation 11.

Class 1 producers as defined in Priorities Regulation 11—large users of metals required to apply under the Production Requirements Plan—are prohibited from extending ratings for any purpose after July 1. They must file PD-25A applications to obtain their materials requirements, and they may apply only ratings assigned on their PRP certificates or ratings specifically assigned to them for construction or acquisition of capital items. Ratings assigned on PRP certificates, like all other ratings, will be applied by the standard form of certification prescribed by the amended Regulation 3.

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Rail Shipments Increase To 666,810 Bbl. Daily

WASHINGTON, D. C.—Rail movement of oil to the East Coast averaged 666,810 bbl. daily during the week ending June 6. This is an increase of 2,580 bbl. a day, or 0.4 per cent, over the preceding week, when car loadings averaged 664,230 bbl. daily.

While this small increase is less than was expected, the Office of Petroleum Coordinator is still hopeful of getting tank-car shipments up to 800,000 bbl. a day.

In shipping 666,810 bbl. daily into the East, 28 companies loaded 22,227 cars. Including cars that were on the way back west for reloading, it is estimated that the East Coast service employed 53,400 cars, taken largely from other sections of the country.

On the basis of an average of 210 bbl. per car, the 22,227 loaded cars carried the equivalent of 4,667,670 bbl. of petroleum and petroleum products during the week.

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DEATHS

MORRIS E. VanVALKENBURG, 40, of Sinclair Prairie Oil Co., Tulsa, died of a heart attack at his home in Tulsa last week. He is survived by the widow and three sons.

HUGH HARLAND TODD, a pioneer in the oil business at Oklahoma City, Okla., as an associate of the Oklahoma Refining Co., died last week at his home in Portland, Ore.

WILLIAM A. DUSENBURY, 63, of Portville, Pa., a director of Forest Oil Co., Bradford, Pa., and Olean, N. Y., banker, died at his camp near Rickburg, N. Y., last week. He had been ill about a week, though his condition had not been considered as serious.

A. E. CROCKETT, 69, special sales representative for Jones & Laughlin Steel Corp., died May 20 after a short illness. Mr. Crockett had been associated with Jones & Laughlin since May 1915.

FRANCIS D. MAHONE, assistant chief and design engineer of Petroleum Rectifying Co. of California, died at a Long Beach, Calif., hospital, May 16. Of late Mr. Mahone's duties kept him closely associated with the company's Long Beach headquarters, but in years past he carried on work for the company in foreign countries and in major fields all over the United States.

CONDENSED DIRECTORY OF THE OFFICE OF PETROLEUM COORDINATOR

Interior Department (New Building) 18th and C Sts., N.W. Phone Republic 1820

Coordinator.—Harold L. Ickes, room 6156, extension 500.
Deputy Coordinator.—Ralph K. Davies, room 6654, extension 3831-2.
Assistant Deputy Coordinator.—Robert E. Allen, room 6647, extension 4645.
Production Division.—D. R. Knowlton, director, room 7410, extension 4861.
Refining Division.—Wright W. Gary, director, room 6637, extension 3233.
Transportation Division.—J. R. Parten, director, room 6629, extension 4418.
Natural Gas and Natural Gasoline Division.—E. Holley Poe, director, room 7423, extension 4860.
Research and Planning Division.—Edward B. Swanson, director, room 7315, extension 649.
Conservation Division.—Everett L. De Golyer, director, room 7516, extension 4459.
Materials Division.—William F. Huff, director, room 7314, extension 4585.
Petroleum Supply Division.—Robert L. Minckler, director, room 7452, extension 4834.
Legal Division.—J. Howard Marshall, chief counsel, room 6649, extension 4100.
Marketing Division.—John W. Frey, director, room 4256, extension 4646.
War Production Board Consultant on Priorities.—O. A. Davis, acting chief, room 7340, extension 4616.
Executive Officer.—Stanley W. Crosthwait, room 6415, extension 4363.
Information Division.—Herbert A. Yocom, director, room 7513, extension 3844.
Foreign Division.—James T. Duce, director, room 4442, extension 4417.
Liaison.—Brig. Gen. Walter B. Pyron, liaison agent between War Department and OPC. Phone Republic 6700, extension 6044, room 6261, new War Dept. Bldg.
Tanker Coordinating Board.—Ralph K. Davies, chairman, room 6654, extension 3831-2.
Receptionist.—Mrs. Rosalie E. Reid, room 6635, extension 3429.

WAR PRODUCTION BOARD

Social Security Building, Fourth and Independence Ave., S.W. Phone Republic 7500

Division of Civilian Supply (Temporary Building D).—Leon Henderson, director, room 46, extension 5586.
Petroleum Unit (Temporary Building R).—W. G. Shallcross, business specialist, room 1709, extension 3722.
Bureau of Industry Branches.—Philip D. Reed, director, room 5420, extension 3394.
Petroleum Machinery and Equipment Section (Temporary Building, East, Seventh Wing, Third Floor).—A. E. Collins, chief, extension 5741.
Liaison With Office of the Petroleum Coordinator and Reconstruction Finance Corp.—R. O. McClintock, room 5193-A, extension 71181.

OFFICE OF PRICE ADMINISTRATOR

Temporary Building D

Administrator.—Leon Henderson, room 46, extension 5586.
Assistant Administrator.—George W. Stocking, in charge of fuels.
Fuels Section.—George Doffing, price executive, room 236, extension 5388.
Petroleum Unit.—Joseph Salmon, chief, room 2703, extension 6376.
Director of Gasoline Rationing (Temporary Building S).—Joel Dean, room 1048, extension 71322.
Oil-Field Equipment (La Salle Building).—U. R. Laves, room 3060, extension 5167.

DISTRICT OPC OFFICES

DISTRICT 1
122 East Forty-second St., Chanin Bldg., New York City

DISTRICT 2
120 South La Salle St. Bldg., Chicago, Ill.

DISTRICT 3
245 Mellie Esperson Bldg., Houston, Tex.

DISTRICT 4
320 First National Bank Bldg., Denver, Colo.

DISTRICT 5
417 S. Hill St., 855 Subway Terminal Bldg., Los Angeles, Calif.

ABSTRACTS

of papers delivered before the American Society of Mechanical Engineers meeting, Cleveland, Ohio, June 8-10

Metal Cutting With Abrasive Wheels

By W. B. HEINZ
Bound Brook, N. J.

THE analytical investigation reported was undertaken in order to determine whether or not the manner in which an abrasive cutoff wheel is operated might have an important effect upon the amount of service obtainable during the life of each wheel; and whether or not the maximum possible cutting rate might also be subject to improvement by better methods of operation. The geometrical relationships involved in cutting round stock have been determined, with the stock rigidly clamped and with the stock rotating in each direction relative to the wheel rotation. Based on the geometry of the several conditions, some predictions have been made as to the advantages which might be gained by a well-organized experimental program.

The Corrosion of Stressed Alloy-Steel Bars by High-Temperature Steam

By H. L. SOLBERG, A. A. POTTER, G. A. HAWKINS and J. T. AGNEW
Purdue University

AN investigation was undertaken of the corrosion by steam of various stressed samples of steels which are available for high-temperature service. Apparatus was constructed and techniques developed for measuring the amount of corrosion on stressed specimens. Data are presented in this paper showing the effect of stress upon the corrosion of carbon-moly, 1.25 Cr-moly, 2 Cr-moly, 7 Cr-moly and 18-8 stainless steel samples. Within the range of the test conditions stress does not influence the penetration or corrosion due to high-temperature steam. No intergranular attack took place except for a small amount in the case of carbon-moly steel during a 2,000-hour test. Chromium content increases the resistance of steels to corrosion by high-temperature steam.

Pulverized Coal for Forge Furnaces

By R. B. ENGDAHL and F. E. GRAVES
Mattelle Memorial Institute

IN the course of a survey to determine possibilities for the use of coal in the metallurgical industries, conducted for Bituminous Coal Research, Inc., at Battelle Memorial Institute, studies were made of the application of pulverized coal to forge furnaces. (At the present time the predominant fuels for forge furnaces are oil and gas.) The results obtained and data compiled from the investigation of the action of pulverized coal is entirely suitable for use on many types and sizes of forging furnaces; that it has the same advantage of fluidity as gas and oil; and that it gives a flame of high emissivity which provides maximum heat transfer by radiation. Of particular importance is the fact that for most sections of the country it is an economical fuel to use for this purpose.

Most of the papers delivered before the American Society of Mechanical Engineers at the annual meeting at Cleveland, Ohio, on June 8-10, deal with subjects pertaining principally to fields other than petroleum. However, many of the papers contain important data which may be converted for application to oil-industry problems.

Some Mechanical Properties of Plastics and Metals Under Sustained Vibrations

By B. J. LAZAN
Pennsylvania State College

A NEW oscillatory-type testing machine was developed for determining the mechanical properties of materials under alternating torsional stress. The damping capacity and dynamic modulus of rigidity of both plastics and metals were evaluated by the use of this machine and studies are reported of how these properties are affected by sustained cyclic stress below the endurance limit and also at impending fatigue failure.

A similar dynamic testing machine was built for applying alternating direct stress and parallel studies were made under axial-loading conditions.

The mechanical properties of selected materials in static tension, compression and torsion were also determined to supplement the dynamic tests. The wide deviations observed between the static and dynamic moduli of elasticity for plastics are analyzed and are associated with the damping capacity of the material.

The significance of these deviations, as related to the repeated constant-deflection type of fatigue test on plastics is discussed. Experimental data on the damping capacities, dynamic moduli of elasticity, and some static mechanical properties are presented for mild steel, duralumin, Grade X laminated bakelite, laminated canvas phenolic and methyl-methacrylate plastic.

Twenty Years of Progress in Domestic Oil Heating

By RENE J. BENDER

THIS paper reviews briefly the history of domestic oil burners and points out that it was not until the designers supplied a positive amount of air under a slight pressure to the oil in the process of gasification that domestic oil burners became a success. The author then discusses the modern vaporizing-type burners, low-pressure atomizing burners, vertical rotary burners, high-pressure atomizing burners, horizontal rotary burners and units specially designed for burning oil instead of the so-called "conversion" type. The domestic use of heavy fuel oil, safety and automatic operating features, increased efficiency, necessity for proper adjustment and possible further improvements are brought out.

A.S.M.E.-S.A.E. Conference

Solutions for Diesel Piston Problems

By FRED ZOLLNER
Zollner Machine Works

PROBLEMS for nonsupercharged diesel engines are outlined and then remarks made on the problems presented by supercharged diesels. The design of pistons for both types of engines is discussed briefly. Careful attention to structural stability, adequate head and ring belt section, adequate ring lands, ring-groove details, piston skirt contour, and ring land clearance and contour are necessary to provide satisfactory piston operation. Oil cooling can be added should conditions become more severe in later-design engines.

Piston Rings and Oil Control in Two-Cycle, High-Output Diesel Engines

By F. GLENN SHOEMAKER and REX ALBRIGHT
Detroit Diesel Engine Division of General Motors Corp.

OIL economy and avoidance of excessive deposits on engine parts are the two primary reasons for the positive control of oil consumption in an internal-combustion engine. Principal factors are the location of oil-control rings, lubrication of compression rings and piston skirt and the air flow past the oil rings. Of primary importance in controlling the consumption of oil are: (1) The piston skirt and compression rings should be lubricated sparingly to avoid excessive deposits; (2) oil must be controlled below the air-intake ports; (3) piston-pin hole must be closed off to keep oil from flooding the piston skirt above the oil rings; (4) piston skirt and

The fifteenth Oil and Gas Power Conference of the American Society of Mechanical Engineers in cooperation with the Society of Automotive Engineers at Peoria, Ill., June 17 to 19, 1942, dealt almost entirely with diesel engines of various types. Abstracts of papers presented during the first 2 days of the meeting are given because of their interest to engineers in the oil industry.

compression rings should carry their lubricant with them; (5) oil rings should be well vented and have unit pressures high enough to control a large amount of oil; and (6) clean air flowing past the oil rings aids in controlling the oil and in keeping the oil passages clear.

Control of Oil Consumption in High-Speed, Four-Cycle Automotive Diesel Engine

By A. T. STAHL
Mack Manufacturing Corp.
International-Plainfield Motor Co.

THE proper control of oil consumption is a burden shared by three groups, the designers, the experimental or development departments and the field organizations. Fixed or variable distortion of the cylinder barrel are outstandingly important in design. The former may be due to forces traceable to stud loading, insufficient deck rigidity or faulty design relation among stud bosses, cylinder bore and cylinder deck. Variable distortion may be caused by defects in the combustion or cooling system. Checking by the experimental department will determine whether there is need of redesign. Such a check will show the absolute oil-consumption rate at the governed speed, smoothness of the change in consumption with speed, the consumption in quarts per mile or quarts per hour and the probable success of the ring arrangement as shown by examination of the cylinders. The service department must decide whether the engines are normal; whether overconsumption is "true" or is due to leaks; overfilling, poor records, etc., the rate of increase in consumption and whether it was more rapid than normal; the presence of cylinder wear, and the part the oil plays in the complaint.

Control of Oil Consumption in Four-Cycle Diesel Air-Cooled Engine

By W. M. McLAURIN
Guiberson Diesel Engine Co.

THIS paper describes the design features of the Model T-120 diesel engine which relate to the problem of oil consumption. In general, it is believed that an experimental basis for the establishment of proper oil control is two-sided in so far as it applies to oil consumption. The oil consumption may be made so low or drastic as to be erratic in manufacture, and unstable or deficient over protracted periods of operation. On the other hand, at full load, reasonable control of oil consumption is desirable not only as a matter of economy but to avoid disturbing the normal combustion process.

Importance of Compression Rings In Controlling Oil Consumption

By MACY O. TEETOR
The Perfect Circle Co.

PISTON rings are usually classified as either compression rings to function as sealing rings or oil rings for the purpose of controlling oil consumption. It is better to consider all the rings on a piston as operating cooperatively rather than to assume that each type has a separate and distinct function. Adequate lubrication is described as just enough to prevent scuffing due to the metal-to-metal contact between the ring and the cylinder walls. The topmost compression ring is generally the one which starts scuffing as it operates under the most adverse conditions.

Cylinder surface temperatures of 400° F. are to be expected and 600° F. in spots is not uncommon. Compression rings lose their tension and shape characteristics at high temperatures. It is usually difficult to tell whether the loss of tension and the change in shape causes the increase in blowby which results in scuffing or whether the scuffing generates the heat that causes the loss of tension and the change in shape.

Increase in the combustion-chamber pressure results in an increased load on the compression rings which places a greater pressure against the cylinder wall and the ring lands. There is a limit to the load capacity of piston rings and exceeding this load results in scuffing.

Scuffing problems created by excessive temperatures and pressures may be attacked in several ways. The problem is principally one of compatibility between the ring and the cylinder wall.

The Positive Displacement Supercharger

By JOHN L. RYDE
McCullock Engineering Co.

THE function of the supercharger is to deliver air of increased density to the cylinder. In effect, it is the first stage of a two-stage air compressor and the same considerations apply. There are three prevalent arrangements: the exhaust driven turbo-blower, the engine or mechanically driven centrifugal unit, and the engine-driven positive-displacement blower unit. The last named is particularly suited to automotive-type engines. The operation of such blowers is characterized by a fixed displacement of air per revolution and delivery is affected only to a small extent by pressure variations. For services requiring a high torque at lower speeds, this characteristic is advantageous as it imparts lugging ability to the engine. The author discusses the performance of the superchargers, the effect of engine design, intercooling, blower design and possibilities for eliminating noise.

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Illinois' Production Trend May Be Reversed

(Continued from Page 17)

would be about on a par. If such deepening is carried on in conjunction with a multizone it would not be necessary to wait until the present producing upper pays were depleted.

Repressuring

Secondary-recovery programs in the state are on the increase and some upsurge in production can be expected from this source. More important is the maintenance of the present production in some of the fields as an offsetting influence to the natural decline. One only has to look at the Carter Oil Co. project in Louden to see what could be accomplished by this method. The decline in the past year has been negligible when compared to other pools in the state.

Water flooding is being attempted by the Forest Development Co. in the old pools near Casey, but so far no application of this method has been mentioned for the newer fields. Gas repressuring is being considered for some pools but the difficulty again is obtaining the equipment.

Principal operation outside Louden is the Salem pool where Texas has been carrying on a repressuring program for several years with the efforts of the company being considerably accelerated during recent months. Trouble has been experienced with freezing of the lines but dehydration and desulfurization equipment has been installed to eliminate this difficulty. The same company is installing a repressuring plant near McLeansboro for injection of gas in the Hoodville-Dale area. Another project which can be considered a major one for Illinois is in the New Harmony Consolidated pool. Warren Petroleum Co. is installing the compression and vapor-recovery equipment and the repressuring will be carried on as a cooperative project. Both of the latter plants are held up because of slow delivery of material but hope to be in operation soon.

TABLE 2—COMPLETIONS BY POOLS BY FORMATIONS FOR 1942, AS OF JUNE 9*

Pool and county—	Formation—	No. of completions
Sailor Springs, Clay	Tar Springs	2
	McClosky	1
	Weiler	1
Bible Grove, Clay	McClosky	5
	Weiler	1
	Weiler and McClosky	1
Clay City Consolidated, Clay	Weiler	1
	Aux Vases	1
	McClosky	2
	Rosiclare, McClosky	1
	Aux Vases, Rosiclare and McClosky	1
	Aux Vases, McClosky	1
	Rosiclare, Cypress	1
Parkersburg, Edwards and Richland	Paint Creek	1
	McClosky	9
Louden, Fayette	Weiler	3
	Devonian	5
Benton North, Franklin	Paint Creek	2
	McClosky	1
Inman, East Gallatin	Weiler, Waltersburg	1
	Weiler	2
Dale, Hamilton	Weiler, Aux Vases	1
	Bethel	1
	Aux Vases	17
	Aux Vases, McClosky	1
Hoodville, Hamilton	Aux Vases	6
	McClosky	1
Rural Hill, Hamilton	Aux Vases, Levias and McClosky	13
	Levias	4
	Levis, McClosky	3
	Levias, Aux Vases	6
	McClosky	4
	Aux Vases	22
	Aux Vases, McClosky	4
	Rosiclare, Aux Vases	1
Walpole, Hamilton	Aux Vases	8
	Tar Springs	1
Dundas Consolidated, Jasper	McClosky	17
	Cypress	2
Salem, Marion	Rosiclare	1
Noble, Richland	Weiler	4
	McClosky	1
Keensburg Consolidated, Wabash	Bethel	1
	Weiler	3
	Weiler, Bethel	2
	Paint Creek Stray	1
Allendale, Wabash	McClosky	1
	Tar Springs	2
	Bethel	3
Mount Carmel, Wabash	Weiler	3
	Biehl	1
Goldengate, Wayne	Aux Vases	1
	Rosiclare	2
Johnsonville, Wayne	McClosky	11
	Aux Vases	14
	Aux Vases, McClosky	5
Sims, Wayne	Levias, McClosky	1
	Rosiclare, McClosky	1
	McClosky	12
	Aux Vases	4
	Aux Vases, McClosky	11
Sims North, Wayne	Rosiclare	1
	McClosky	1
	Aux Vases	2
Centerville, White	Aux Vases	1
	Levias, Tar Springs	1
	Tar Springs	3
	McClosky	8
Epworth, White	Degonia	1
	Clore	4
Herald, White	Bethel	1
	Cypress	1
Maunie South, White	Palestine, Tar Springs	1
	Tar Springs	2
	Palestine	3
New Harmony Consolidated, White	Waltersburg	2
	Bethel, Aux Vases	3
	Weiler	1
	Bethel	3
	Weiler, Aux Vases	2
	McClosky	3
	Aux Vases	10
Roland, White	Waltersburg	7
	Bethel	4
	Waltersburg, Bethel	2
	Aux Vases	3
	Waltersburg, Paint Creek Stray	1
	Bethel, Aux Vases	1
Stokes, White	Paint Creek	2
	Tar Springs, Paint Creek	1
Mill Shoals, White	Aux Vases	11
	McClosky	1

*Table compiled by Illinois Geological Survey.

ENGINEERING *and Operating* SECTION

Casing Recovery at Old Wells Conserves Steel for War Effort

By HARRY F. SIMONS

Maintenance for Victory

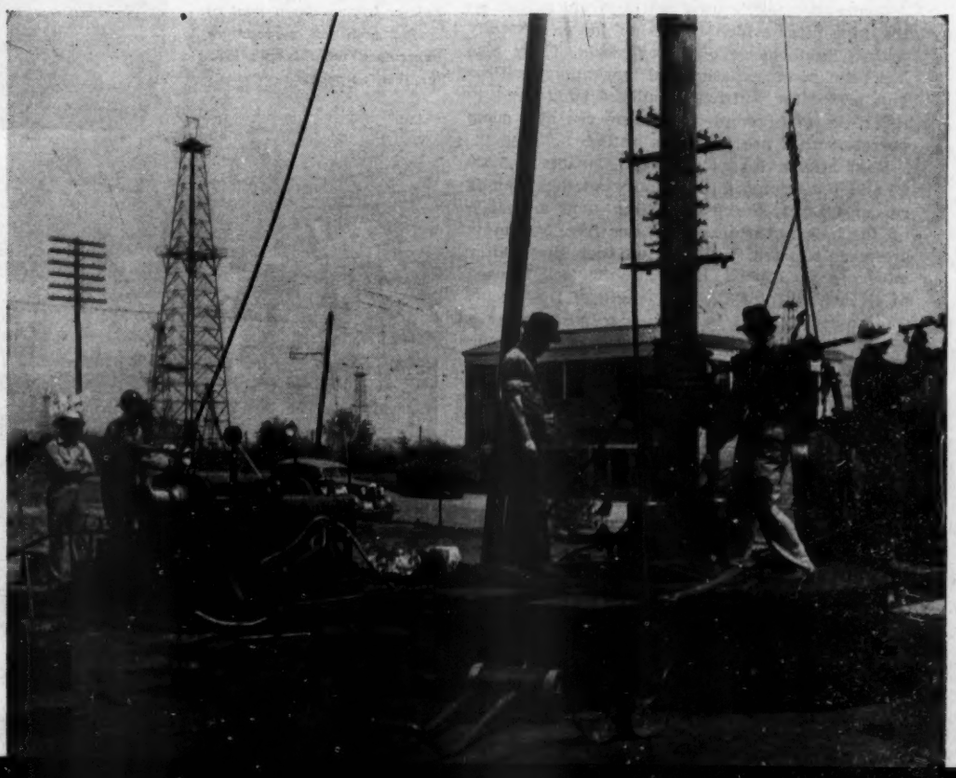
Conservation of high-grade steel casing is necessary to provide steel for more essential war duty. Pipe for new wells can be obtained by reclaiming it from abandoned or uneconomic wells. This article describes recovery methods for long strings at Oklahoma City.

THE general feeling is that once casing is run in a well it is permanently lost as far as the steel industry is concerned. It is classified as being totally used, meaning that it will not reappear as junk to be run through the steel mills again and emerge in some new product. Actually, the reclamation of oil-well casing is a rather large and thriving business and no wells are abandoned without an attempt to recover the casing.

That this casing does not appear in the scrap is due to a long-standing practice of the men in the industry of using this reclaimed pipe. An extreme example of this practice was seen in the recent development in Illinois. Pulling of casing from the old wells on the eastern side of the state had resulted in the accumulation of a large stock of second-hand pipe. Many operators in the newer fields appeared as buyers of this material, and the pipe was run in new wells. Some of this pipe was over 25 years old at that time and was being run in wells with an anticipated life of 10 to 20 years.

The casing recovered from the old Illinois wells had been corroded to a certain extent due to the fact the wells were drilled with cable tools and no effort had been made to fill the annular space between the pipe and the hole with a protective fluid. Better casing is recovered from rotary-drilled holes as the neutral mud between the casing and the formation acts as a protector and prevents corrosion. In many cases, the mill numbers painted on the pipe when it was new are clearly legible and the paint applied at the mill is practically undamaged.

There must be an inspection of the pipe after it is pulled from the well to find any defective joints and to determine the condition of the threads. Much of this pipe was run before the introduction of modern thread lubricants and considerable damage to the threads is often found.



Right: Engine-driven hydraulic jack raises casing. Note heavy I-beams across cellar to provide support for jack

Left: Joint of casing being broken out with tongs, jerkline and cathead.
Right: After joint has been broken, it is spun out with spinning line on cathead

This damage may be repaired with a specially designed thread file or the threads may have to be run through a lathe or a rethreading machine.

Much of the pipe recovered from deeper wells can be returned to similar service as the deterioration is less than 10 per cent. When it is considered that a safety factor of at least two is used in designing a casing string, it is evident that the old casing can be used in combination with new pipe to equip a new deep well.

The work at Oklahoma City is an excellent example of casing recovery. The casing program in that pool varied but a majority of the wells were equipped with 7-in. pay strings approximately 6,400 ft. in length. Cement was placed behind the pipe and in some instances rose as high as 3,000 ft. off bottom. Probably the average height of the cement was somewhere in the neighborhood of 2,000 ft.

As the wells reach the economic limit they are prepared for abandonment by sealing off the producing horizons and then the pipe is pulled. In addition to the pay string there may be two or three protective strings.

Generally from 4,000 to 4,400 ft. of this Grade D, 7-in. casing is recovered from each well pulled. The average recovery is around 4,200 ft. The 4,400 ft. figure is the maximum generally because the remainder of the string is set in cement.

The method used in pulling this pipe has been developed especially for conditions in the field. A hydraulic jack is used and a strain placed on the pipe after which it is shot loose, generally with a light charge of nitroglycerin. There also has been some experimental work done with a gun perforator, sufficient bullets being used to sever the pipe completely. There are also some operators that use an inside cutter.

First attempt to shoot loose is made at 5,000 ft. and if the pipe fails to move another shot is run at 4,800 ft. Successive 200-ft. steps are made up the hole until the pipe comes free. Attempts are made to work the pipe after each shot. After movement is started, the hydraulic jack is used to elevate the pipe the full length of the stroke. The casing is held in the upper position by a special splicer built into the base of the frame while the movable portion of the jack is lowered for a new bite. This operation is continued until a joint is pulled from the hole and broken out and laid down, after which the cycle is started over again. After the pipe comes free, a crew of four men can pull approximately 3,000 ft. in 8 hours.

Where a derrick is available a unit of sufficient size is used to pull the last portion of the string without the aid of the jacks.

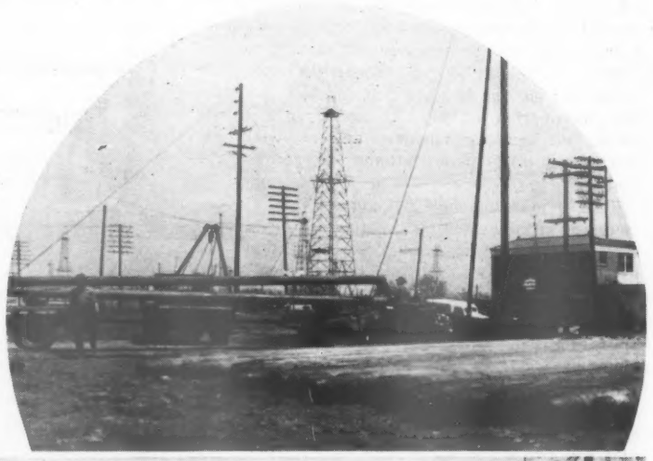
Either a single-pole or a double-pole mast is used over the wells with no derrick to swing the casing tongs and for lowering the casing joints after they are unscrewed from the remainder of the string. A board walk is laid away from the hole so the casing can be tailed out on a regular wagon.

Many wells at Oklahoma City are equipped with concrete cellars about 10 ft. in diameter. To provide a support for the jack and a working platform, two 20-in. I-beams 12 ft. in length are placed over the well. If only a wooden cellar is around the well, it is necessary to crib up with timbers to obtain the necessary support. The jacks used have a capacity of 400 tons and frequently this amount of force is used in moving the casing. Pressure for the jacks is supplied by a pump driven by an internal-combustion engine which also drives the hoisting equipment for handling each joint as it is broken out and the cathead for breaking out and spinning out of the joints.

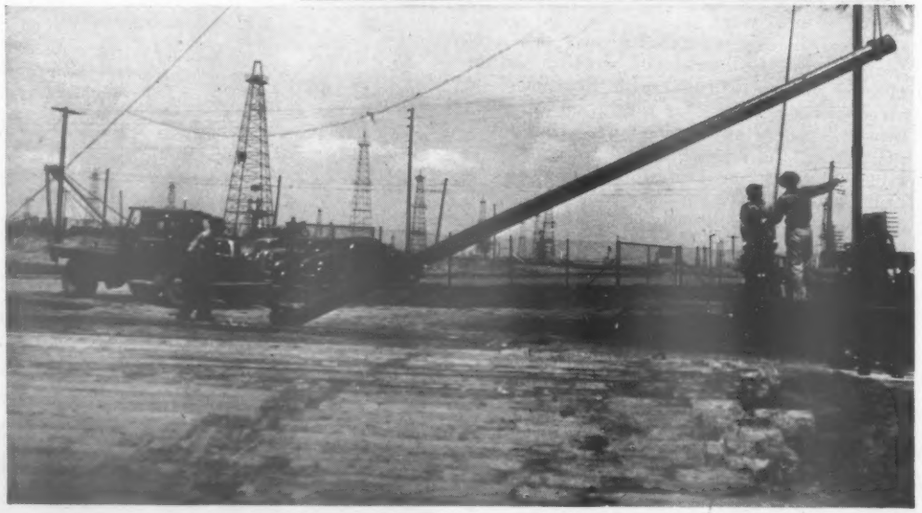
The amount of pipe which can be recovered from a well is dependent principally on the height of the cement behind it. Where casing has been set on a shelf or with only a few sacks of cement in wells at Oklahoma City, it has been possible to recover the entire string. Recently on a Gulf Coast well, over 8,000 ft. of pipe was recovered.

The method used in this case was slightly different, an inside cutting tool being run in on a drill string and a section of the casing freed by cutting. This section was then pulled by running a spear, after which another cut was made and another section pulled.

Right: Loading pipe on truck with gin poles; some of the pipe has to be reconditioned and all of it has to be inspected



Below: Laying down joint of casing with tail wagon; an improvised walk is provided for this purpose



Development, Operation and Valuation of Oil and Gas Properties—Part 4

Flow of Homogeneous Fluids:

Water in Virgin Oil and Gas Pays

By PARK J. JONES
Petroleum Engineer, Texas Co., Fort Worth, Tex.

This is the fourth in a series of articles by the author appearing in The Oil and Gas Journal on Development, Operation and Valuation of Oil and Gas Properties. Previous subjects discussed were "Effective Porosity, Specific Permeability and the Geometry of Spacing," issue of May 28; "Flow of Homogeneous Fluids Through Linear Systems," issue of June 4, and "Flow of Homogeneous Fluids Through Radial Systems," June 11. Installment 5 will appear next week and will be titled, "Flow of Oil-Water Mixtures Through Media of Uniform Permeability."

1. *Introduction.*—The water content of hydrophylic oil and gas pays prior to any advancement of bottom water or edgewater may be classified as (1) trapped water (2) absorbed water and (3) capillary water.

Trapped water occurs in pores which are not interconnected and in permeably isolated lenses within oil and gas pays proper. Water may also be trapped in lenses within oil and gas pays if the lower end of the water-bearing lense is sealed off or if its spillage level is lower than the spillage level of the surrounding pay. Trapped water is free water which otherwise would have been displaced by oil or gas. Being free water, trapped water if penetrated by a well bore is produced upon withdrawal of oil and/or gas.

Adsorbed water occurs on the surfaces of, and within, the clay and shale particles dispersed among the pores of oil and gas pays. Adsorbed water is not free water but it may be produced upon withdrawal of oil and/or gas if the clay or shale particles are forced into a well.

Capillary water is the water held by interfacial forces within the smaller portions of the pores which otherwise may be filled with oil and/or gas. Capillary water is not free water. Capillary water is produced upon withdrawal of oil and/or gas only if replaced (by capillary action) with noncapillary (free) water. An exception to this statement is that in a region of abnormally high pressure gradients some capillary water may be forced out.

The free water occurring in lenses within oil and gas pays, just like lenses of shale, may be a significant factor in developing and operating oil and gas properties. However, such water is not considered here as a fraction of the water in oil and gas pays proper. The free water occurring in noninterconnected pores, though it influences water-saturation determinations in a laboratory, is not considered here as water in oil and gas pays proper. In other words, free water whether it (1) is trapped within a pay (2) exists below the so-called gas-water or oil-water contacts or (3) has encroached as a driving fluid or has advanced by capillary action is not considered here as a part of the water content of virgin oil and gas pays.

Interstitial Water

The nonfree water occurring in oil and gas pays is called "connate" or "interstitial" water. As such water may or may not be connate, the word "interstitial" is preferred as a general term. The amount of interstitial water in hydrophylic* oil and gas pays ranges from 10 per cent of porosity up to as high as 60 per cent of porosity. As a general rule, interstitial water is not produced upon withdrawal of oil and/or gas except by replacement through capillary action and possibly by the driving forces of oil and/or gas in regions of unusually high pressure gradients. In discussing these phenomena and in attempting to place a numerical value upon the water saturation of virgin oil and gas pays, it is convenient to consider interstitial water as the sum of capillary water and absorbed water. This distinction is not so much a matter of fact as it is of convenience, for some of the water here called capillary may be adsorbed and vice versa.

2. *Physical properties of oil and gas pays.*—Most sand and limestone pays are of the sandstone type* in the sense that the individual grains may be separated without being broken. The average grain diameter of any medium capable of being separated into component parts may be calculated from screen analyses with the aid of the following equation

$$\bar{d} = \sqrt[3]{\frac{\Sigma d^3 n}{\Sigma n}}$$

where

$\bar{d}$ = average diameter of grains, inches
d = arithmetic diameter of grains determined from screen analysis, inches
n = weight fraction of grains of a particular arithmetic diameter

The grains of porous media vary in angularity

TABLE 4—SCREEN ANALYSES OF SANDS (AFTER FANCHER, LEWIS AND BARNES*)

Mesh	Opening (in.)	Sand number 1	2	3	4
10	0.0787				
20	0.0331				
30	0.0232				
40	0.0165			0.24	
50	0.0117			0.62	
70	0.0083		0.15	1.39	
100	0.0059	3.81	6.57	11.74	
140	0.0041	57.30	56.04	71.54	
200	0.0029	17.42	17.99	6.90	11.4
270	0.0021	12.59	10.13	6.95	20.32
Over 270	0.0021	8.88	9.12	0.62	78.54
Porosity, %		12.5	12.3	16.9	37.0
Aver. grain diam. (in.)		0.00222	0.00220	0.00385	0.00113
Permeability (darcys)		0.0026	0.0028	0.0444	0.0051

Mesh	Opening (in.)	Sand number 5	6	7	8
10	0.787				
20	0.0331				
30	0.0232				
40	0.0165	0.59			0.17
50	0.0117	12.84		0.29	2.44
70	0.0083	46.67		18.43	23.23
100	0.0059	14.61		42.09	49.28
140	0.0041	8.77		31.93	22.45
200	0.0029	2.94	1.14	4.70	1.77
270	0.0021	2.60	20.32	1.31	0.44
Over 270	0.0021	10.98	78.54	1.16	0.22
Porosity, %		20.3	37.8	19.7	15.9
Aver. grain diam. (in.)		0.00217	0.00113	0.00398	0.00550
Permeability (darcys)		0.0295	0.0088	0.182	0.350

Mesh	Opening (in.)	Sand number 9	10	11	12
10	0.787	3.41			
20	0.0031	17.35			
30	0.0232	24.34			
40	0.0165	30.14			
50	0.0117	14.59	0.07	0.15	
70	0.0083	4.92	6.90	9.41	0.20
100	0.0059	2.03	48.21	43.06	31.76
140	0.0041	1.75	25.83	30.12	61.84
200	0.0029	0.69	4.73	3.89	2.19
270	0.0021	0.78	3.31	2.57	2.31
Over 270	0.0021		10.95	10.80	1.61
Porosity, %		11.94	19.5	18.4	22.3
Aver. grain diam. (in.)		0.00986	0.00214	0.00216	0.00355
Permeability (darcys)		1.130	0.0638	0.0672	0.228

Mesh	Opening (in.)	Sand number 13	14	15	16
10	0.0787				
20	0.0331				
30	0.0232				
40	0.0165	0.17			0.07
50	0.0117	2.44		0.05	5.86
70	0.0083	23.23	0.04	0.92	49.28
100	0.0059	49.28	7.33	22.70	18.61
140	0.0041	22.45	58.26	64.70	9.00
200	0.0029	1.77	20.05	6.44	3.68
270	0.0021	0.44	9.26	3.10	2.46
Over 270	.0021	0.22	5.06	2.09	11.04
Porosity, %		16.3	19.2	21.4	20.6
Aver. grain diam. (in.)		0.00550	0.00256	0.0033	0.00216
Permeability (darcys)		0.555	0.139	0.241	0.126

Mesh	Opening (in.)	Sand number 17	18	19	20
10	0.0787				
20	0.0331				
30	0.0232				
40	0.0165			0.14	
50	0.0117		0.09	2.11	2.25
70	0.0083		1.68	10.01	30.78
100	0.0059		24.03	20.64	54.15
140	0.0041		60.83	42.17	12.15
200	0.0029	1.14	9.61	13.28	0.50
270	0.0021	20.32	2.27	6.74	0.11
Over 270	0.0021	78.54	1.49	4.91	0.06
Porosity, %		33.2	21.9	23.8	26.9
Aver. grain diam. (in.)		0.00113	0.00357	0.00265	0.00658
Permeability (darcys)		0.0371	0.417	0.111	2.500

Mesh	Opening (in.)	Sand number 21	22	23
10	0.0787			
20	0.0331			
30	0.0232			
40	0.0165		1.77	
50	0.0117		36.59	0.21
70	0.0083	0.98	53.92	8.25
100	0.0059	14.90	5.43	58.23
140	0.0041	68.99	1.25	27.80
200	0.0029	10.74	0.39	4.17
270	0.0021	3.00	0.35	1.09
Over 270	0.0021	1.39	0.30	0.25
Porosity, %		27.7	22.1	28.8
Aver. grain diam. (in.)		0.00355	0.00638	0.00504
Permeability (darcys)		0.859	3.390	2.350

All analyses expressed as per cent weight retained on the respective sieve.
*Fancher, G. H., Lewis, J. A., and Barnes, K. B., Min. Ind. Exp. Sta. Penn State College Bull. 12, 1933.

*Hydrophobic media are not being considered.

from well-rounded nearly spherical grains (oolites) to micaceous plates (shales). Irregularities in shapes for the same size distribution of grains causes an increase in porosity.*

An idea as to the variation in porosity and permeability with grain-size distribution may be had from Table 4. The sources of the samples in Table 4 are listed in Table 5. It has been shown† that in most cases involving water-laid sediments the size distribution approximates the law of probability. In other words, aside from "fines" which usually are bonding materials, a screen analysis of a core will yield only a limited number of grain sizes grouped about some one grain size as indicated in Table 4. Such distribution of grain sizes is the result of sorting. However, even though a high degree of sorting may have controlled the deposition of sediments originally, subsequent changes in form and packing, infiltration of fines, and redeposited silica or silicates and other bonding materials profoundly alter the porosity and permeability of a medium,[10] as a result of which, there is no correlation between porosity and permeability or between either one of these and average diameter of grains.

Nevertheless, a crude approximation to the extent of variation in some properties of oil and gas pays (aside from fines) may be had from the geometry of spheres. Thus, with the aid of Table 2 it can be verified that the number of pores per cubic foot of rhombohedrally packed spheres of uniform diameter is equal to $305/r^3$ and that the surface area in square feet per cubic foot equals $26.66/r$.

Now, the upper limit of grain diameters of oil and gas pays is on the order of 0.01 inches. The lower limit is on the order of 0.002 in. Table 6 illustrates the number of pores and surface area corresponding to these limits. Nutting[9 10] has shown that the maximum pore diameter is about 0.2 of the average grain diameter. Actually, the distance between grains varies from zero at points of contact up to about 0.2 of average grain diameter in the center or pores. Other things being equal, the distances between grains control the amount of interstitial water in oil and gas pays.

3. *Interfacial tension.*—The tendency of liqud surfaces exposed to gases to contract is called surface tension. The surface tension of pure water at room temperature is on the order of 74 dynes/cm. or 0.00017 lb./in. Because of surface tension, there is a pressure difference between the two sides of a liquid surface.‡ The pressure is always greater on the concave side of a liquid surface by an amount in accordance with the following equation,

$$P_c = \gamma\left(\frac{1}{r_1} + \frac{1}{r_2}\right) \qquad (1)$$

where

P_c = pressure difference or capillary pressure, lb. per sq. in.
γ = surface tension, lb./in.
$\left(\frac{1}{r_1} + \frac{1}{r_2}\right)$ = sum of the reciprocals of the radii of curvature in any two mutually perpendicular directions, 1/in.

If one end of a glass capillary tube is under water and the other exposed to air, at equilibrium the water level in the tube will be at a height above the free (noncapillary) water level which may be calculated from

$$P_c = (\rho_w - \rho_a)h - \gamma\left(\frac{1}{r_1} + \frac{1}{r_2}\right) = \frac{2\gamma}{r} \qquad (2)$$

where

ρ_w = specific weight of water
ρ_a = specific weight of air
r = radius of capillary tube
h = height above free water level

*Fraser, H. J., Journal of Geology, 43, 912 (1925).
†Hatch, Journal Franklin Institute, 215, 27 (1933).
‡See any textbook on properties of matter. One pound per inch = 175,000 dynes/cm.

TABLE 5—SOURCE OF SAMPLES IN TABLE 4 (AFTER FANCHER, LEWIS AND BARNES)

Sample No.	Sand	State	Field of locality
1	Bradford	Pennsylvania	Bradford
2	Bradford	Pennsylvania	Bradford
3	Third Venango	Pennsylvania	Oil City
4	Ceramic A	20% bond	
5	Robinson	Illinois	S. E. Illinois
6	Ceramic B	10% bond	
7	Woodbine	Texas	East Texas
8	Wilcox	Oklahoma	Seminole
9	Third Venango	Pennsylvania	Venango
10	Robinson	Illinois	S. E. Illinois
11	Robinson	Illinois	S. E. Illinois
12	Third Venango	Pennsylvania	Oil City
13	Wilcox	Oklahoma	Seminole
14	Warren	Pennsylvania	Warren
15	Third Venango	Pennsylvania	Oil City
16	Robinson	Illinois	S. E. Illinois
17	Ceramic C	5% bond	
18	Third Venango	Pennsylvania	Oil City
19	Woodbine	Texas	East Texas
20	Woodbine	Texas	East Texas
21	Woodbine	Texas	East Texas
22	Woodbine	Texas	East Texas
23	Woodbine	Texas	East Texas

TABLE 6—NUMBER OF PORES AND SURFACE AREA PER CUBIC FOOT OF RHOMBOHEDRALLY PACKED SPHERES OF UNIFORM DIAMETER

Diam. of spheres (in.)	Millions of pores	Surface area (sq. ft.)
.01	2,440	5,332
.008	4,765	6,665
.006	11,296	8,887
.004	38,125	13,330
.002	305,000	26,660

Because of the relationship in Equation (2), the pressure difference across a liquid film is called capillary pressure. The capillary pressure caused by the surface tension of pure water in a capillary tube of 0.0001-in. diameter is on the order of 17 lb. per sq. in. The corresponding height of the water level in the capillary tube above the free-water surface is on the order of 40 ft.

Definite Interface

When water is in contact with another nonmiscible liquid, for example oil, a definite interface exists and water tends to maintain a surface of minimum area just as it does in the presence of gases. This contractile tendency is called interfacial tension. Equations (1) and (2) are valid provided γ is read "interfacial" rather than "surface" tension. Some numerical values of interfacial tensions[4] under conditions existing in reservoirs are listed in Table 7.

4. *Capillary water.*—If a practical laboratory technique for the determination of effective radii of curvature of porous media could be worked out, then the distribution of interstitial water above the free (noncapillary) level could be calculated with the aid of Equations (4.3.1) and (4.3.2) as proposed by Garrison.[8] However, because of variation of grain sizes; presence of bonding material; and the presence of smaller grains, clay, and/or shale within the pore spaces between the larger grains; determination of the effective radii of curvature in porous media seems insurmountable.

More recently, Leverett[7] working with clean unconsolidated sands obtained satisfactory correlation on the basis of the following expression,

$$S_w = \phi\left(\frac{\Delta\rho h}{\gamma}\sqrt{\frac{K}{f}}\right) \qquad (1)$$

where

S_w = water saturation, fraction of pore space
$\Delta\rho$ = difference in specific weights of water and oil
h = height above noncapillary water level
γ = interfacial tension
K = specific permeability
f = porosity
ϕ = functional relationship

By comparing Equations (4.3.2) and (4.4.1) it will be noted that $\Delta\rho h/\gamma$ represents the effective interfacial curvature. Obviously, if a functional relationship exists and is established empirically for various types of media, it would then be possible to calculate the distribution of water in oil and gas pays in terms of the porosity and permeability of the pays.

Based on Equation (4.4.1) and the following assumptions: Oil-water, gas-oil, and was-gas interfacial tensions: 35, 20, and 65 dynes/cm., respectively; specific gravities oil, water, and gas: 0.7, 1.0, and 0.1, respectively; sand permeability: 1,000 md.; porosity: 35 per cent; total thickness of oil interval: 8.5 ft.—Leverett[7] calculated the values for the curves in Fig. 9.

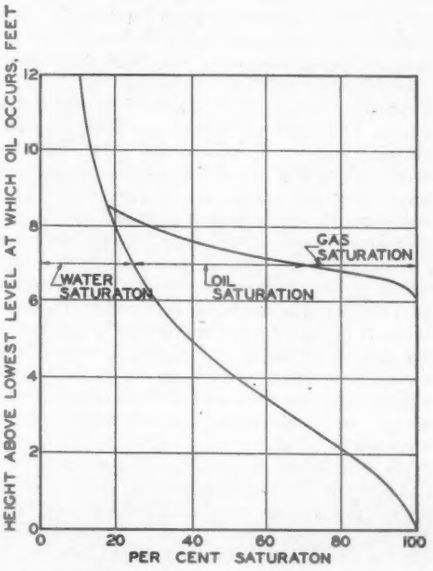


FIG. 9 CALCULATED DISTRIBUTION OF OIL, GAS, AND WATER IN A UNIFORM UNCONSOLIDATED SAND (LEVERETT, A.I.M.E.)

5. *Adsorbed water.*—Clays and shales contained variable quantities of particles of different sizes ranging from relatively coarse to fine materials of colloidal dimensions. The typical minerals of clays and shales are micaceous in structure, and are characterized by a large surface per unit volume upon which water is adsorbed.[3] The water

(Continued on Page 42)

TABLE 7—INTERFACIAL TENSION UNDER RESERVOIR CONDITIONS (AFTER HOCOTT, A.I.M.E.)

Interfacial tension, dynes/cm.						Surface tension, dynes/cm.			
Anahuac: 178° F.		Conroe: 170° F.		K.M.A.: 130° F.		78		150	
Pressure (lb./sq.in.)	Interfacial tension	Pressure (lb./sq.in.)	Interfacial tension	Pressure (lb./sq.in.)	Interfacial tension	Pressure (lb./sq.in.)	Surface tension	Pressure (lb./sq.in.)	Surface tension
3,500	30.5	3,700	30.6	2,500	34.8	0	74.1	0	67.5
3,500	30.6	3,000	31.2	2,000	35.3	100	71.1	100	63.2
3,150	30.7	2,500	31.7	1,590	36.0	250	66.5	250	58.8
2,580	30.3	2,000	32.6	1,520	35.9	500	61.6	500	55.5
2,050	30.1	1,550	31.5	1,000	35.8	1,000	55.9	1,000	50.4
1,540	30.2	1,020	29.5	770	35.7	1,500	51.6	1,500	46.5
1,120	30.1	515	27.8	500	35.4	2,000	47.9	2,000	42.3
470	29.1	260	26.8	260	34.7	2,700	44.1	2,700	39.5
100	27.7	100	25.8	100	33.4	3,000	42.2	3,000	37.4
0	27.1	0	25.1	0	31.4	3,500	40.3	3,500	36.0
3,120		2,035		1,570		Bubble-point pressure, lb. per sq. in., P_b			
640		550		650		Gas-oil ratio at P_b, cu. ft. per bbl.			
33.5		36.9		41.3		Oil gravity, °A.P.I.			

Dehydrating Liquids and Gases With Granular Adsorbents

By R. G. CAPELL and R. C. AMERO
Technical Director and Assistant Technical Director, Floridin Co., Warren, Pa.

The removal of moisture and sulfur from natural gases and refinery distillates is becoming increasingly important as higher transfer pressures introduce freezing problems and as adverse conversions result from processing sulfur-bearing refinery intermediates over catalysts which are often poisoned by sulfur. The removal of moisture and sulfur can be advantageously carried out in the plant by passing the stream through granular adsorbents which can be revivified. The characteristics of the procedure and limitations for revivifying the adsorbing media are clearly outlined here.

THE necessity for some type of dehydration to prevent hydrate formation is now well recognized by the natural-gas industry. The advantages of dehydrating gasoline, butane, and other light petroleum products, particularly to prevent freeze-ups, control internal corrosion and maintain full capacity of pipe lines, have recently been established. There are many other applications where dehydration is beneficial or absolutely essential, such as the production of nitrogen-grade benzene and toluene, isomerization of butane and the production of synthetic rubber. Of the common drying agents available, granular adsorbents have the highest drying efficiency. In addition, they retain their shape and hardness when saturated with water and can be regenerated hundreds of times. They are noncorrosive to equipment and can be handled freely without harm to the workmen.

The possibilities of silica gel were investigated by some early workers in this field, but almost all existing plants use Florite or dehydrated aluminum oxide. Anhydrous calcium sulfate has also been used to a limited extent. The physical properties of these materials, as obtained from laboratory and field data, the literature, and manufacturers' bulletins are presented in Table 1.

Gas Dehydration

Laboratory and field experience have shown that the design of a gas drying unit involves but a few simple factors. Although the following observations refer specifically to Florite, in almost every installation any of the desiccants can be used interchangeably if allowance is made for differences in capacity and regeneration temperature. The gas to be dried should enter the unit at as low a temperature as possible (less than 120° F., preferably below 80° F.), at a velocity calculated as 60 ft. per minute or less through the empty tower.* Down flow is preferred on the drying cycle to prevent lifting of the bed by extreme gas velocities, channeling, etc., and for regeneration, gas flows in the opposite direction. A design capacity of 5 per cent adsorption is assumed and the height of the tower is determined by the amount of desiccant required. The desiccant is generally supported on four or five successive trays or screens, although its mechanical strength is great enough to support its own weight in beds of any practical depth. Pressure-drop data have been tabulated for all practical temperatures and pressures and shown to be rather low for a well-screened material.

Fig. 1 is a flow sheet of a unit drying gas for pipe-line transmission. Where insufficient cooling water is available, the regenerating gas is cooled by heat exchangers in the main gas stream or in an air-cooled radiator. In some installations, particularly recycling plants, the regeneration gas is used for fuel or sent to the flare. There are other systems that have also proven satisfactory, but under the usual operating conditions, the arrangement pictured gives adequate protection against hydrate formation.

There has been much discussion about the effect of sulfur compounds on the life of the desiccant but so far as it is possible to determine, this problem has never been thoroughly investigated. One unit drying gas that contains 0.009 grains of mercaptan sulfur and a trace of hydrogen sulfide has been operating for over a year on the same charge of Florite, and there is as yet no indication that the desiccant will ever have to be replaced. On the other hand, a sour gas containing oxygen is very severe, because it precipitates elementary sulfur on the granules of desiccant. For example, one unit in Illinois drying gas that contains 30 grains of hydrogen sulfide and almost indetectable traces of oxygen lasts about 2 months before a new charge of desiccant is required. Sulfur deposited on the desiccant melts during regeneration and, on cooling, solidifies again. The desiccant eventually becomes so thoroughly fouled that gas can no longer reach the active surfaces to be dehydrated The rate of decline in efficiency is practically the same for all granular desiccants. It is doubtful whether this severe fouling would occur in the absence of oxygen; for instance, in a plant where the entire gathering system was under a positive pressure and there was no chance for an infiltration of air. However, with the inexpensive desiccants available today, a unit can be recharged periodically at little cost, even where the rate of fouling is rather high.

When the gas being dried contains an appreciable amount of distillate, the desiccant adsorbs large quantities of the distillate in the first part of the drying cycle, but the distillate is replaced by water as the drying cycle proceeds. The

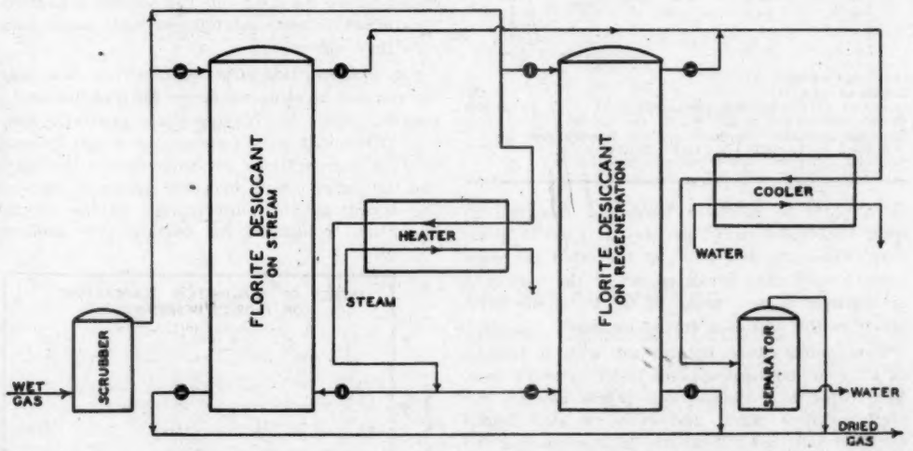


Fig. 1

*There are some indications that the moisture capacity of a desiccant will be appreciably increased, almost doubled, if gas velocities of 20 ft./minute or less are used, but the effect has never been carefully investigated. For example, one gas company that reported an initial moisture capacity around 8 per cent on a Florite unit designed for a gas velocity of 44 ft./minute has recently built another unit of practically the same size designed for a lower gas velocity, and the new unit shows an initial moisture capacity of 12 to 13 per cent.

TABLE 1—PHYSICAL PROPERTIES OF DESICCANTS

	Florite	Aluminum oxide	Silica gel	Calcium sulfate (soluble anhydrite)
True specific gravity	3.40	3.3	2.2	2.9
Apparent density, approximately	50 lb./cu. ft.	50	38 to 40	60
Specific heat	0.24	0.24	0.22	0.18
Hardness*	75 to 85	75 to 85	65 to 75	55 to 65
Adsorption capacity:				
At break point	7 to 9%, by wt.	12 to 14	10 to 20	6.6
At saturation	21%	20 to 25	40	12 to 14
Commercial flow rates:				
Typical for gases	20 to 60 ft./min.	25 to 50	25 to 70	.....
Typical for liquids	2 to 15 gal./lb. (hr.)	.....	.....	.....

*A 100-ml. sample of desiccant was screened to true mesh size, agitated in a pan with steel balls and rescreened. The weight per cent of the material that was still of true mesh size was called the "hardness." (Modification of U. S. Chemical Warfare Service Test.)

moisture adsorption capacity and the minimum available dew point are apparently not affected. Similarly, compressor lubricating oil and absorption oil carried over in the vapor phase have a negligible effect on the desiccant, but it is general practice to precede the drying unit with a scrubber to remove liquid droplets entrained in the gas stream. This not only reduces the possibility of fouling the adsorbent, but also decreases the drying load by removing any water that is present in the liquid phase.

Two figures may generally be given for the capacity of a desiccant; that is, capacity to the break point or per cent water removed at maximum efficiency and total moisture capacity or per cent water adsorbed when a desiccant is saturated. These figures are given in Table 1. Table 2 shows the course of a normal drying cycle as determined on a small pilot-plant unit which was set up at a western Texas compressor station to investigate the relative performance of different drying agents. Table 3 gives the same information

TABLE 2—ADSORPTION CAPACITY ON WEIGHT BASIS TYPICAL PILOT PLANT DATA

Silica gel		Florite		Aluminum oxide	
Per cent adsorbed by weight	Dew point °F.	Per cent adsorbed by weight	Dew point °F.	Per cent adsorbed by weight	Dew point °F.
0	<—10	0	<—10	0	<—10
22.2	<—10	9.0	<—10	10.5	<—10
22.9	—9	9.7	—2	11.2	+5
23.7	—2	10.2	+6	11.3	+10
24.5	—1				
25.6	+6				

Diameter of bed, 7⅝ in.
Depth of bed, 34⅝ in.
Natural gas at 88° to 92° F., 720 lb. per sq. in.
Average gas flow, approximately 6,000 std. cu. ft./hour.

TABLE 3—ADSORPTION CAPACITY ON WEIGHT BASIS FULL SCALE PLANT DATA—FLORITE

Per cent adsorbed by weight	Dew point (°F.)
0.0	<—20
0.6	<—20
1.7	<—10
3.2	<—7
5.6	<—2
7.3	< +3
7.6	< +5

Diameter of bed, ft.	3
Depth of bed, ft.	20
Quantity of Florite per tower, lb.	6,800
Sweet natural gas at 56° F., lb. per sq. in.	950
Average gas flow in each of two towers connected in parallel, M.c.f./24 hours	37.5

on a plant in northern Louisiana, designed to treat 100,000,000 cu. ft. per day at 1,200 lb. pressure. Since the dew point of the dried gas rises rapidly once the "break point" of the desiccant is reached, a dew point of 0° F. is normally taken as the end of a drying cycle.

Dew points were determined with a Bureau of Mines standard dew-point tester in every case. Very often hydrocarbon dew points obscure the moisture dew point, and even an experienced operator will have difficulty in determining the exact temperature at which the first cloud of moisure or hydrate forms in the instrument. Also, when using propane as a refrigerant, the lowest temperature that can be easily obtained with this instrument is about —20° F. and for control purposes, —10° F. is generally considered adequate. For these reasons, dew points are often reported as less than a certain value, as in Tables 2 and 3, since the actual figures cannot be readily determined. For one test, a small filter containing pipe cleaners coated with vaseline was successfully used to remove distillate before the dew point was determined. The effect of this filter on the moisture content of the gas was not determined but appeared to be negligible.

Plants have been built to dry gas at pressures

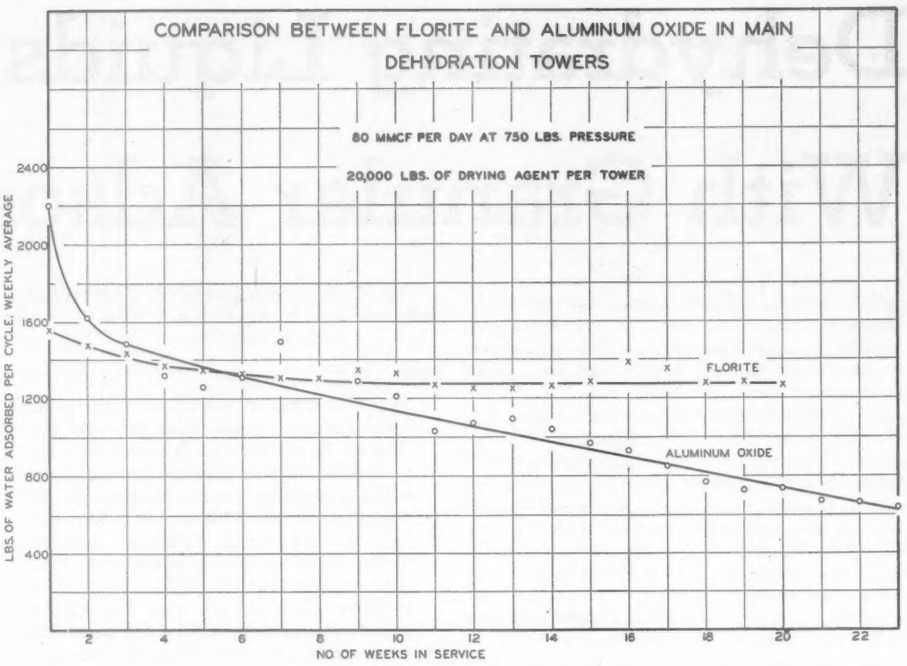


Fig. 2

as high as 1,200 lb. and completely satisfactory pilot-plant tests have been made at 2,000 lb. with regeneration carried out at full line pressure. There seems to be no reason why this type of plant could not be used at still higher pressures with satisfactory results.

Field practice has brought out one significant difference in desiccants which was never appreciated in the laboratory where relatively few regenerations are carried out on the same sample. On successive regenerations, some desiccants decline in capacity until they reach the point where one tower of the drying unit can not be regenerated before the other one has become exhausted. This effect is more pronounced with some materials than others.

Fig. 2 shows this effect as observed in a commercial unit treating sweet gas for pipe-line transmission. Since one drying cycle generally lasts 8 to 12 hours, 1 week's operations would indicate 8 to 10 regenerations for each bed of desiccant and the curve covers over 200 cycles on each of the drying agents. Observations on the Florite have been continued for over a year and its

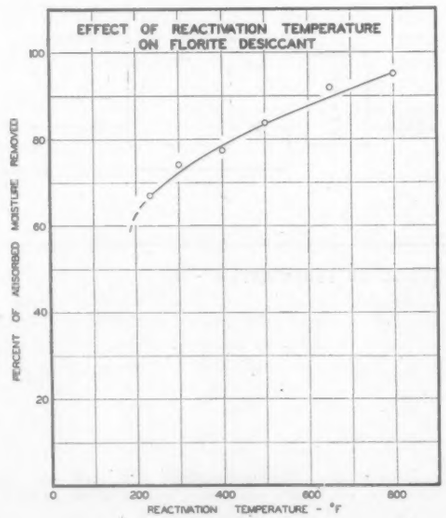


Fig. 3

capacity seems to have levelled off at 6½ per cent moisture adsorption.

Regeneration

Approximately 10 per cent of the incoming gas flow is diverted from the main stream and heated to 350-400° F. for regeneration. As shown in Fig. 3, the higher the temperature of the gas, the higher the percentage of moisture removed from the desiccant. Part of the moisture is chemically combined and is essential; if it were removed, the activity of the desiccant would be destroyed. It will be noted that at 350-400° F., most of the moisture is removed and this temperature is easily reached with the steam available around gas plants and refineries.

All of the common desiccants, with the possible exception of silica gel, can be safely heated to 600° F., or higher. Attempts have been made to burn deposits of sulfur or hydrocarbon polymers out of fouled desiccants, and at these high, uncontrolled temperatures, the adsorbent was rendered useless although it looked as good as new.

The heat required for regeneration is the sensible heat necessary to raise the desiccant and tower to the temperature of regeneration plus the latent heat of the water to be evaporated and of course, any heat losses. The temperature of gas leaving a tower during regeneration follows a characteristic curve, such as shown in Fig. 4. This particular curve was obtained during the plant acceptance tests run on the unit treating 100,000,000 cu. ft. at 1,200 lb. pressure, which was referred to previously. The reactivation curve levels off at two places; first, when the temperature becomes high enough to release the adsorbed water in large quantities (about 250° F.) and second, when the outlet gas approaches the temperature of the inlet gas. After the first plateau has been passed, and the outlet temperature reaches 300-350° F., regeneration is assumed to be complete.

Liquid Dehydration

Liquid products can be dehydrated satisfactorily in a two-tower arrangement similar to that shown in Fig. 1; however, to utilize the maximum adsorption capacity of the desiccant, an arrangement such as that shown in Fig. 5 is sometimes used; that is, a freshly activated tower is con-

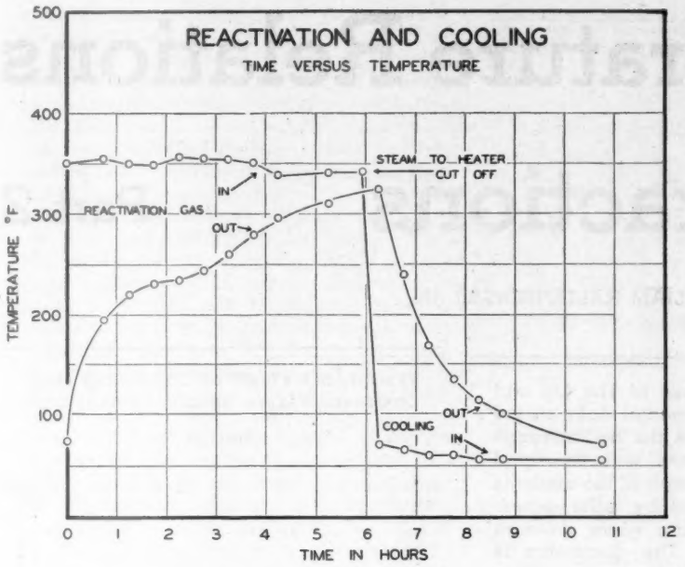


Fig. 4

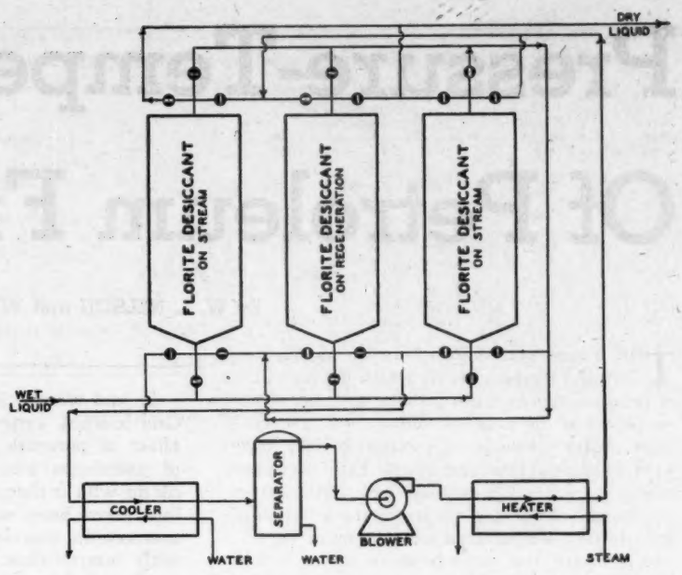


Fig. 5

nected in series with one partially exhausted, while the third tower is being regenerated.

The liquid generally flows up through the tower so any entrained slugs of water can be trapped out at the bottom of the tower. One report on a propane drying unit in Illinois indicates that slugs of caustic, such as might be carried over from a sweetening treatment, must be particularly guarded against, because the desiccant cannot be regenerated afterwards. This is an unusual condition, of course, and occurs only at rare intervals. With normal operation, the desiccant lasts indefinitely. A similar unit in West Virginia has been in service over 14 months and has completed over 400 drying cycles with no change in efficiency.

As an example of an installation treating slightly heavier liquids, a gasoline plant in southern Kansas is using three towers 4 ft. in diameter by about 10 ft. high, each holding an 8-ft. bed of 4/8-mesh Florite to dehydrate gasoline, kerosene, and the like for pipe-line transmission. The plant is designed to treat 10,000 bbl. per day, reducing the moisture content from 80 to 40 p.p.m. Actually, performance is somewhat better than this, since the dried products contain much less than 40 p.p.m. Another plant in the same vicinity which has been operating on Florite since 1939 uses four towers which are 4 ft. in diameter and 9 ft. high, each charged with 3,000 lb. of Florite. The plant handles 19,000 gal. per hour of light products going to a 6-in. pipe line and up to the present time, the line shows no evidence of internal corrosion. This plant operates on the two-tower system, that is, two towers are in the dehydration cycle in parallel while the other two are being regenerated in parallel.

Complete Dehydration

These plants report that the moisture content is reduced by about 50 per cent which is adequate under normal conditions, although laboratory tests under rather severe conditions (short column, short time of contact) show that complete dehydration can be obtained.

Fig. 6 represents the dehydration of a naphtha (distillation range from 200° to 294° F.), filtered through a 15-in. column of fine-mesh Florite in the laboratory. The rate of percolation was 10.5 gal. per pound per hour, or 1.4 ft. per minute velocity through the empty tower. Moisture content was determined by titration of the naphtha with Karl Fischer reagent, a method that is sensitive to 2 to 4r p.p.m. of water in a 100-ml. sample. Here again Florite showed a sharp break point, this time at 5.3 per cent, but it continued to effect partial dehydration up to more than 6.25 per cent. When the low moisture content of saturated naphtha is taken into consideration, it is easily shown that more than 2,000 bbl. could be partially dehydrated at the end of a drying cycle for each ton of desiccant used. This is the reason that the three-tower system is sometimes preferred. There is some evidence that the actual capacity of a desiccant varies directly with the moisture content of the liquid being dehydrated. For example,

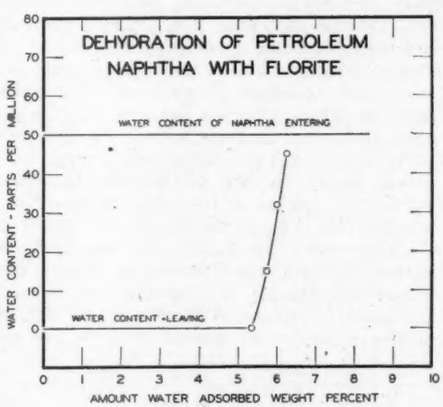

DEHYDRATION OF PETROLEUM NAPHTHA WITH FLORITE
WATER CONTENT OF NAPHTHA ENTERING
WATER CONTENT - LEAVING
WATER CONTENT - PARTS PER MILLION
AMOUNT WATER ADSORBED WEIGHT PERCENT

Fig. 6

the break point in Fig. 6 might have been over 6 per cent instead of 5.3 per cent if the initial naphtha had a moisture content of 80 p.p.m.

Toluene is an interesting example of one of the newer petroleum products that can be dehydrated advantageously. Government specifications for nitration-grade toluene require a distillation range of 1° F. or less, and the presence of moisture will extend this range to 1.3° F. With granular adsorbents, toluene can be dehydrated to 10 p.p.m. and benzene to 4 p.p.m. Methanol, ethanol, and isopropanol cannot be dehydrated by the conventional percolation methods but special techniques have been proposed (R. B. Derr, U. S. Patent No. 1,985,205).

Regeneration

Liquid remaining in a tower at the end of a drying cycle is drained to a sump or back to storage and hot gas is introduced for regeneration. One unit uses propane vapors as a regeneration medium; another brings in a sweet fuel gas while a third introduces superheated steam at 400° F. directly into the bed, then follows this with hot air to complete the drying. Cracked gases or sour gases might cause fouling of the bed and are generally avoided. Where the gas is available in limited quantities, or is too valuable to send to a flare, it is circulated as shown in Fig. 5. When regeneration is complete, cooling can be effected with unheated regeneration gas, or by flooding the tower with some of the dehydrated liquid. This is not only a very quick method but also frees the tower of gas which would prove objectionable if the liquid were going to a pipe line.

Engineers and operators are becoming more and more "moisture conscious" as time goes on, and the efficiency and economy of granular desiccants are proving valuable in many widely different applications.

Acknowledgments

The permission of the Floridin Co. to publish this information and the assistance of J. W. Moore in performing the test work, and L. B. Christie in drawing the curves, are hereby gratefully acknowledged.

●

Belt Saving by Using Larger, Discarded Lengths

An idea of the lengths to which salvage measures can be profitably carried is provided by one plant's handling of a belt. A 20-in. six-ply belt, 42 ft. in length, was badly needed and the operator had a 32-in. eight-ply belt which had been discarded because of wear on the top and bottom plies.

A manufacturer's representative helped the operator to remove the top and bottom plies and slit the belt into 20-in. and 12-in. widths and the 20-ft. section was spliced into an endless belt of the desired length. The 12-in. section was then further split and spliced to provide 112 ft. of 6-in. belting. Cost of this operation was $36.10, while the cost of the new belting would have been $279.

From a war angle, this operation resulted in the saving of 80 lb. of crude rubber which would have been required to make new belts comparable to the salvaged ones. (Extracted from report of B. F. Goodrich Co.)

Pressure-Temperature Relations Of Petroleum Fractions Part 2

By W. L. NELSON and WILLIAM HALTENBERGER, JR.
School of Petroleum Engineering, University of Tulsa

In last week's issue of The Oil and Gas Journal, experimental data on the effect of pressure on the boiling-range of petroleum fractions was presented along with a discussion of the methods that have been used by other experimentors in correlating vapor pressure with temperature. The discussion is continued here and terminates with a direct comparison with the vapor-pressure behavior of the normal paraffin hydrocarbons.

THE Young relationship between vapor pressure and temperature by which the logarithm of pressure approximates a linear function of the reciprocal of the absolute temperature, underlies most of the methods of correlation that have been employed. Cox[2] and others[3] have developed charts or correlation methods which differ from the Young relationship mainly by the selection of an arbitrary temperature scale in prace of $1/T$. which makes the vapor-pressure curve into a true linear function of temperature throughout extended ranges.

The Ramsay-Young relation, $T_1/T_2 = T_1'/T_2' + C(T_1' - T_1)$, where T is the absolute boiling point of related substances 1 and 2 at a given pressure, T' is the absolute atmospheric boiling point and C is a constant, is better suited for comparing petroleum fractions with one another than the Young relation. The constant C is nearly equal to zero for related substances, and in such an instance $T_1/T_1' = T_2/T_2'$. This relation has been used extensively in the following nonabsolute-temperature-scale form, $t = at' + b$, where t and t' are degrees F. or C. at various pressures and a and b are constants. Thus, the normal paraffins and other related families yield straight lines where t is plotted against t'; and the data of Beal and Docksey[5] and Beale[3] on narrow boiling-range petroleum fractions behave in this manner. The Brown-Coats chart[6] which represents the vapor pressures of the normal paraffins as horizontal straight lines, is based on a cross-plot of the lines of the paraffins on the t versus t' chart.

The equation $\log p = (a - b)(T'/T)$, symbols as defined above, was used by Bridgeman, Aldrich, and White[4] and Meyer[7] to correlate the bubble points of a total of 47 gasolines. This equation is derived from the Young relation, and also embodies features of the Ramsay-Young relation. The experimental data on all of the gasolines were found to fall very near the same line on a log p versus T'/T chart. Such a chart would provide an excellent means of correlation for the vapor pressures of petroleum fractions were it not for the inconvenience of converting ratios of absolute temperature to degrees C. or F.

Correlation of Experimental Data

The data of the Engler and of the A.S.T.M. distillations, discussed in Part 1 of this paper, can be represented within the experimental error by means of the following relations:

1. Constant percentages evaporated give straight lines on the Cox-type chart (Fig. 8).
2. Distillation curves are parallel, or more precisely, vertically displaced (Figs. 2, 3, 4, 5, and 6).
3. Constant percentages evaporated can be represented on a Cox chart by congruent straight lines, within a 200° F. boiling range (Fig. 8).
4. The points of congruence characteristic of the fractions studied are situated on a line of constant pressure, and are approximately linear with respect to the A.P.I. gravities of the fractions (Fig. 8).
5. Fifty per cent boiling points, when plotted as isobars of boiling points at any pressure versus boiling point at atmospheric pressure, fall near a straight line that deviates from the line representing the normal paraffin hydrocarbons (Fig. 9).

The correlation of the experimental data is based on Relations 1 and 2., i.e., the Cox chart or parallelism of the distillation curve. Relation 3 was used as a check on Relation 2 and as an auxiliary in handling confusing data. The distillation curve on each Figs. 3, 4, 5, and 6 was constructed by drawing a curve parallel to the distillation curve for which the experimental data were most consistent. These were the 100-mm. curve for the naphtha, the kerosene, and the gas oil; and the 150-mm. curve for the wax distillate. With all the Engler distillations, curves were drawn parallel to the atmospheric distillation curve. The spacing of the curves is given by a straight line through the 50 per cent points on the Cox chart. The 50 per cent line itself was drawn in such a way (Relation 3) as to be consistent with the set of congruent lines through the other percentages as shown for four samples on Fig. 8. Deviations between observed and cor-

TABLE 3—DEVIATIONS OF CORRELATED FROM OBSERVED VALUES, ENGLER DISTILLATIONS

Pressure, mm. Hg	Deviations, °F. Obs. corr. at 50%	Arithm. aver.
Sample 1		
740	0.0	0.0
500	1.3	1.1
300	—1.4	1.4
150	0.0	0.8
Sample 12		
740	0.0	0.0
400	+1.0	1.5
195	—0.5	1.0
85	0.0	2.7
Sample 2		
740	0.0	0.0
400	—1.6	0.7
195	—0.9	0.9
85	—2.2	0.7
Sample 1234		
740	0.0	0.0
400	+1.3	0.4
195	+0.2	1.0
85	—2.2	2.5
Sample 3		
740	0.0	0.0
400	—0.4	0.9
195	—0.3	1.0
85	+1.2	0.9
32	+1.4	0.6
Sample 4		
740	0.0	0.0
400	+1.8	1.8
195	+0.8	1.7
85	—0.8	1.7
32	0.0	2.0

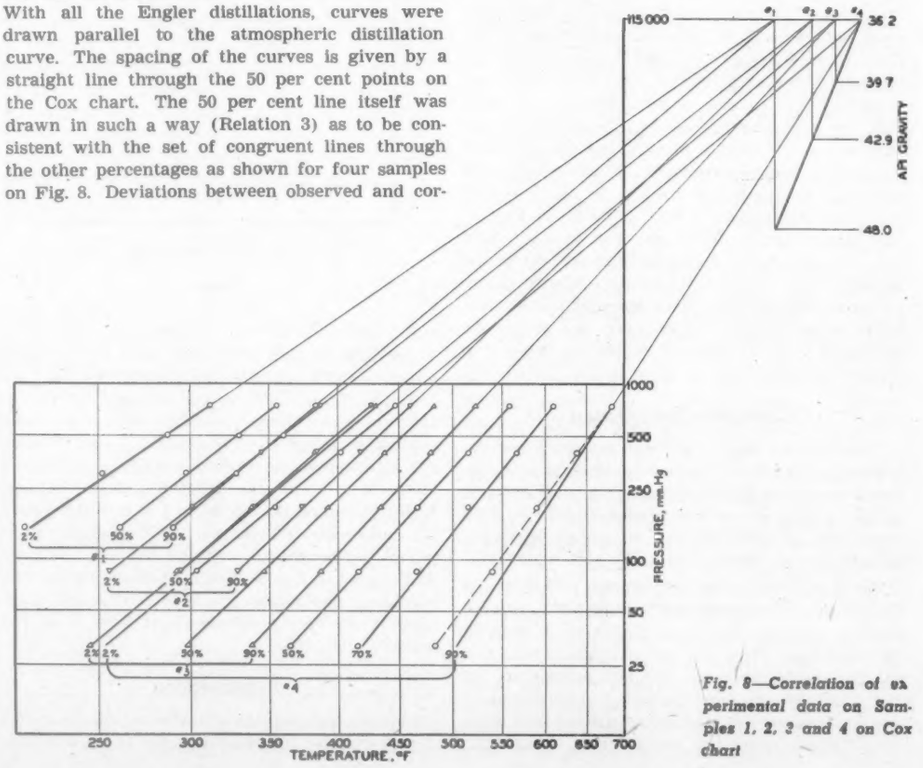


Fig. 8—Correlation of experimental data on Samples 1, 2, 3 and 4 on Cox chart

related values for the Engler distillations are given in Table 3. Differences in the 50 per cent points and arithmetic average deviations for the entire distillation curve are shown. Comparing these deviations with the deviations of the repeat runs from each other in Table 2 shows the correlation to be within the experimental error. Correlated and experimental values for the Engler distillations are shown graphically only for Sample 4 (Fig. 2). Inspection of Table 3 shows that the other samples exhibit an equal or better agreement. Deviations for the A.S.T.M. runs appear in Figs. 3, 4, 5, and 6. Considering the reliability of these data, as discussed under "Experimental Resules," the correlation can be considered satisfactory.

It was found that all of the data could be represented within the experimental error as straight lines on a Cox chart, whereas on the Young chart, the data appeared as slightly curved lines. The 90 per cent line for the wide-boiling Sample 4, as shown by the dotted line in Fig. 8, is straight, although it is not congruent with the lines for lower percentages evaporated.

All experimental data can be represented by an equation of the form $1/(388 + t) = a + b$ (A.P.I.), where t is 50 per cent boiling point, but it is not expected that this equation will apply to other types of oils.

The 50 per cent points of the 10 samples were correlated with each other and with some of the data of other investigators by means of Relation 5, as shown in Fig. 9 (see also Table 4). Straight lines were obtained which deviate somewhat from those for the normal paraffins.

TABLE 4—CHARACTERISTICS OF THE SAMPLES USED IN THE FINAL CORRELATION

Sample	Description—	50% temperature, F. pressures, mm. Hg 760	400	200	100	40	10-90% range, F.	A.P.I. gravity	Charact. factor
Engler 500 cc. Method									
Present investigation:									
1	Absorber oil	357	315	275	240	...	52	48.0	11.86
12	Blend, 1 and 2	396	352	310	273	...	87	45.5	11.90
2	Kerosene	428	384	341	303	...	60	42.9	11.83
1234	Blend, 1, 2, 3, and 4	448	404	361	324		179	41.6	11.84
3	Gas oil	485	439	394	354	308	76	39.7	11.88
4	Pressure lube	560	514	468	425	375	209	36.2	11.94
A.S.T.M. 100 cc. Method									
A-1	Naphtha	347	307	268	233	193	139	...	....
A-2	Kerosene	448	406	364	327	283	125	...	....
A-3	Gas oil	619	572	525	483	430	332	....	....
A-4	Wax distillate	679	629	582	537	485	*196	...	....
Engler 200 cc. Method									
Watson and Wirth:									
W		574	530	487	446	399	350	19.6	10.80
Bubble Point, Combined With A.S.T.M. Method									
Bridgeman, Aldrich and White:									
U	S plus 40 per cent benzene	194	153	115	81	43	198	46.0	10.86
RL	Russian naphtha	217	174	136	102	63	135	64.0	12.10
T	S and 20 per cent benzene	228	188	151	118	80	212	51.8	11.40
D	Acceleration	252	207	166	132	94	200	56.2	11.82
RH	Russian naphtha	259	216	176	142	102	150	60.0	12.10
S	1928 U. S. motor	275	232	193	158	120	227	57.4	12.02
R	Residue blend	289	243	200	164	124	187	53.2	11.83
V	S and 20 per cent naphtha	297	253	211	176	134	209	55.7	12.03

*20-90 per cent range.

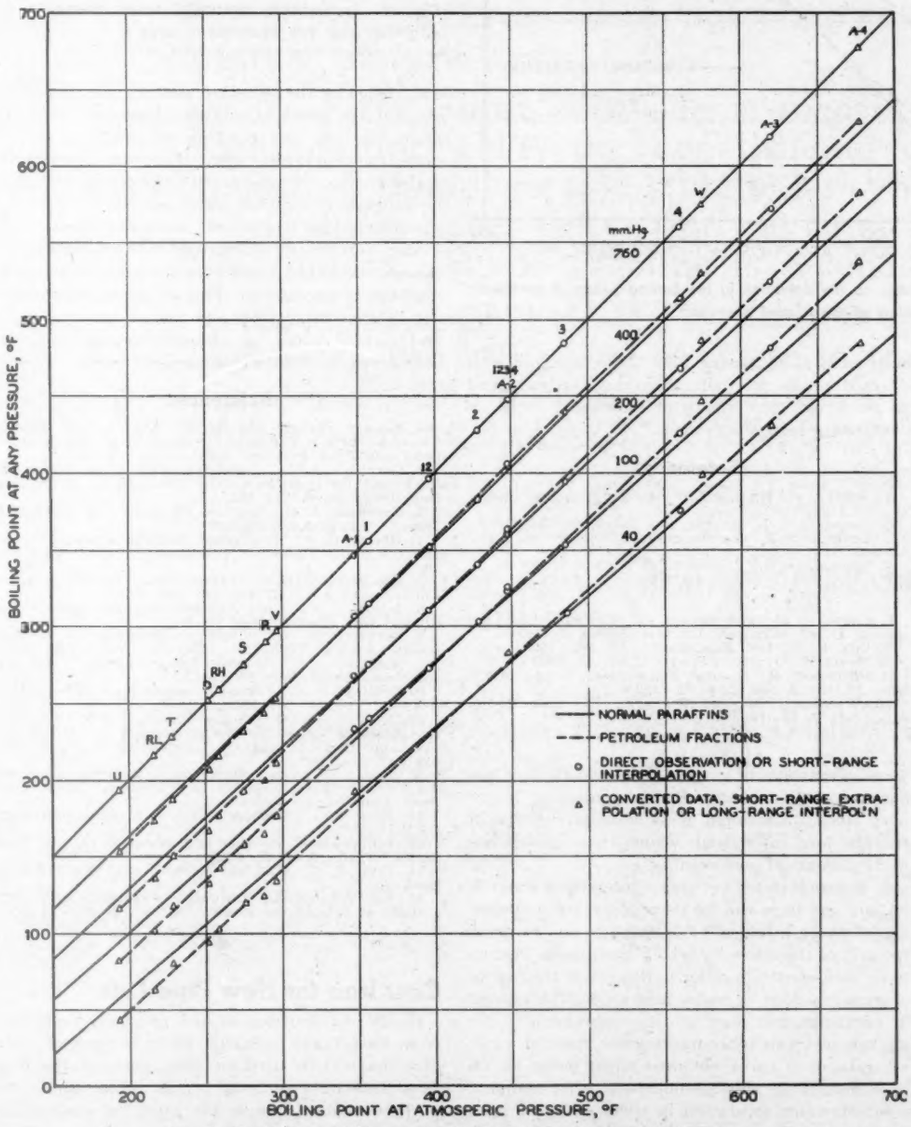


Fig. 9—Correlations of 50 per cent Engler points of petroleum fractions

The high-temperature end of the isobars characteristic of petroleum fractions is based on the data of the present investigation, converted to the pressures shown by means of interpolation and extrapolation on the Cox chart. Except for Sample A-4 (wax distillate), the extrapolations and interpolations were over ranges that would not permit an error of more than 1° F.

The low-temperature end of the isobars is based on converted data of Bridgeman, Aldrich, and White.[4] These authors found that the atmospheric bubble points of all of the gasolines investigated were on the average within about 2° F. of the 10 per cent A.S.T.M. distillation points of the gasolines. Assuming the bubble points to be equal to the 10 per cent points, the 50 per cent points at the various pressures were calculated by constructing distillation curves through the 10 per cent points, parallel to the atmospheric A.S.T.M. distillation curve. The probable error for this conversion is less than 5° F. for the lowest pressure shown. Of the 33 gasolines investigated by Bridgeman, Aldrich, and White, 8 gasolines of widely differing characteristics are shown on Fig. 9.

Although deviations of the 50 per cent points of petroleum fractions from the boiling points of the normal paraffins appear to be a function of temperature, the deviations are also influenced by the boiling range of the fractions. This is evident in Table 4 and the same appears to be substantiated by the data of Beale and Docksey[3] on high-boiling narrow fractions, which show practically no deviation from the boiling points of the normal paraffins. From the evidence available, it is not possible to decide the extent to which the deviations are affected by the boiling range, and therefore the correlation presented cannot be safely applied to boiling ranges widely different from those shown.

Question arises whether the high or low ends of the distillation curves, say the 90 or 10 per cent points, might not offer a better basis for correlation than do the 50 per cent points. In Fig. 10, the 10-90 per cent boiling range of a wide-boiling (Sample 4) and a narrow-boiling (Sample 2) fraction are plotted by the same method as used for Fig. 9. It appears from Fig. 10 that deviations from the behavior of the paraffins is greater at low and at high percentages distilled, and that any percentage distilled might be used as a basis of correlation except that the type of distillation would probably affect the 50 per cent

point less than it would affect most other percentages.

Conclusions

Although the correlation presented in Fig. 9 cannot be regarded as final, it does serve as a basis for comparison between the pressure-temperature relations of petroleum fractions and of the normal paraffin hydrocarbons. On the basis of the available data, the following generalizations appear to be permissible: (1) The effect of temperature on the change of boiling point with pressure is less pronounced for petroleum fractions than it is for the normal paraffin hydrocarbons. (2) Deviations of the mean boiling points of petroleum fractions tend to increase with an increase in their boiling range. (3) Deviations are greatest for the initial boiling points of low-boiling fractions and for the end points of high-boiling fractions.

Although Fig. 9 indicates that the change in boiling point of petroleum fractions when the pressure is reduced from 760 to 40 mm. is in the extreme about 10°-15° F. less than the change suffered by the paraffin hydrocarbons, this difference does not affect most refinery design computations to a vital or even practical extent, and hence the use of the vapor pressures of the paraffin hydrocarbons for evaluating the effect of pressure on petroleum fractions need not in most instances be abandoned. Extrapolation of the data presented here indicates that the vapor pressures of petroleum hydrocarbons boiling from 700° to 1,000° F. may deviate to a practical extent from the vapor pressure of the paraffin hydrocarbons.

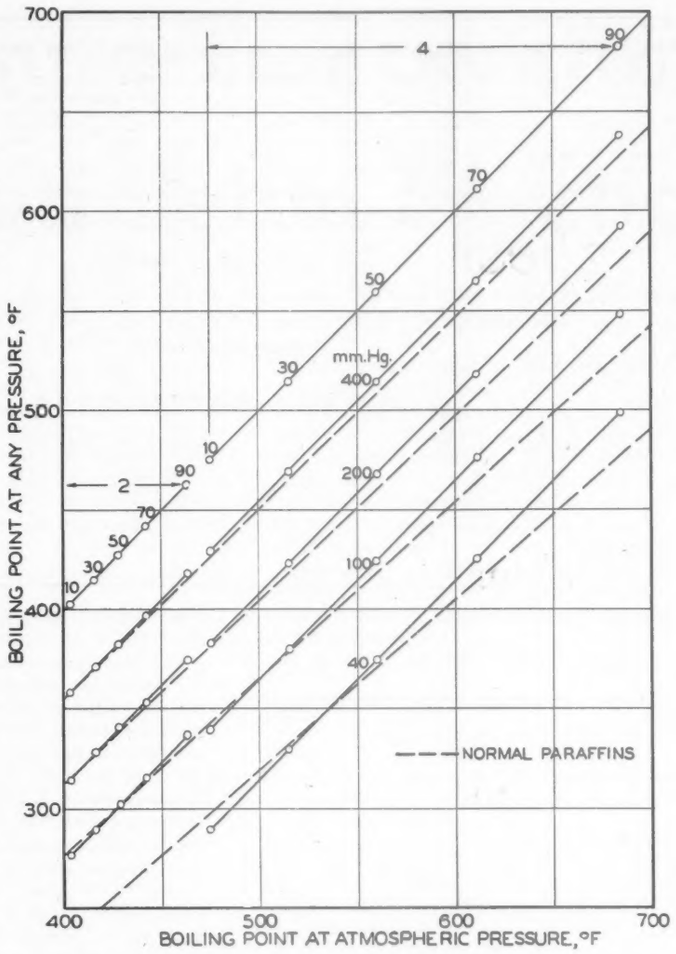


Fig. 10—Effect of boiling range on the deviation of the boiling points of petroleum fractions from the boiling points of the normal paraffins

Acknowledgments

The authors are grateful for the assistance of Dr. J. A. Johnston, who supervised laboratory work during 1 whole year; to the laboratory assistants, L. C. Hudry and R. C. Beardon, who devoted much of their time without pay, and to numerous students who have cooperated in conducting laboratory work.

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Flow of Homogeneous Fluids: Water in Virgin Oil, Gas Pays

(Continued from Page 36)

associated with the clay and shale particles dispersed in oil and gas pays is here considered as a component of interstitial water. All of the water associated with the fines in oil and gas pays is not necessarily adsorbed water. Some of the water may be held by capillary forces. The point is that the higher the water saturation in hydrophylic oil and gas pays containing clays and shales is attributable to the presence of these fines. Well-sorted pays contain less interstitial water than pays not well sorted. Similarly, limestones and dolomites, because of a relatively smaller number of larger pore spaces associated with secondary porosity, contain less interstitial water than sandstones having identical permeability.

6. *Residual water in cores.*—Interstitial water in oil and gas pays can be determined from the residual water in cores[8 12 13] if there is no "contamination" of the cores by water from mud. Tracers have been used[8 13] in order to determine the degree of contamination by water base muds. The amount of contamination may also be approximated for a given reservoir by comparing the residual water saturations in cores obtained when using an oil base mud. Still another approach is to compare residual water saturation in cores obtained from cable-tool wells out of which water is pumped prior to drilling in. Residual water in cores is the sum of interstitial water and imbibed and/or infiltrated water. The extent of contamination may be anywhere from zero up to 30 per cent of porosity, depending on the conditions attending coring.

7. *Tentative values on interstitial water.*—Based on published information and on limited personal experience, the curves in Fig. 10 are submitted. The indicated values are tentative and subject to revision in the light of further information. The values are for virgin oil and gas pays prior to encroachment and capillary advancement of any free water. As the amounts of interstitial water depends upon the effective radii of curvature, obviously the application of Fig. 10 depends on a knowledge of the effective radii of curvature. In general, the effect of solution channels, fractures, dolomitization, and bonding materials, is to reduce the curvature and, therefore, interstitial water content; whereas, the presence of silty material tends to increase water content.

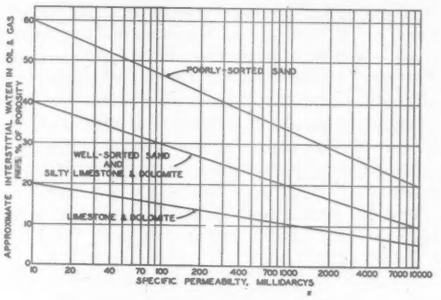

Fig. 10—Approximate interstitial water saturation of virgin oil and gas hydrophylic pays
(Tentative values subject to revision)

8. *Interstitial water vs. ultimate recovery.*—Under certain conditions interstitial water increases the ultimate recovery available to primary methods of production. This effect of nonshrinkage of interstitial water and that of gravity forces and surface forces, on ultimate recovery will be considered in detail on subsequent pages.

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Cast Iron for New Pipe Line

In the construction of the proposed pipe line from East Texas to Salem, Ill., it is reported that cast-iron will be used on some parts of the line as a substitute material. This is the first important modern major oil pipe-line project to employ cast iron.

The highest war values

Universal research and development in the laboratory and in the field are always devoted to just one purpose—to realize the utmost possible value from every barrel of crude oil refined

When that value is measured in gasoline, Dubbscracking produces the highest yield from every kind of charging stock U.O.P. catalytic polymerization produces still more gasoline of still higher octane rating from the cracked gases

Those processes have not changed but the refining picture has

Now the value of crude is measured chiefly in toluene for TNT, the constituents of 100-octane gasoline, butadiene and styrene for synthetic rubber —products never before derived commercially from petroleum Motor gasoline is secondary

So today other U.O.P. catalytic processes are realizing the full value of crude in those vital war products The processes are not war babies—they have been in course of development for years

War found them ready—they are working for victory

Every refiner may use any or all of them, under license from Universal

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
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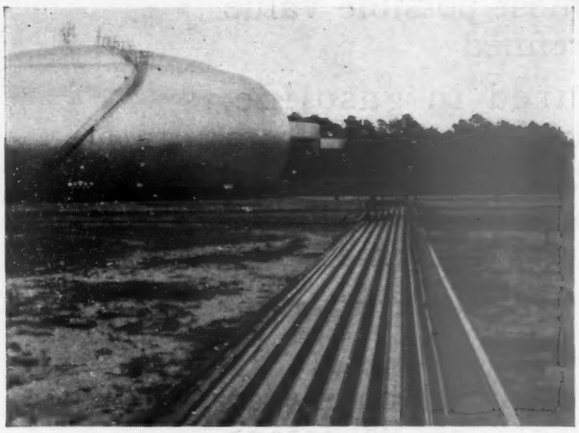
THE REFINERS INSTITUTE OF PETROLEUM TECHNOLOGY

Refinery IDEAS

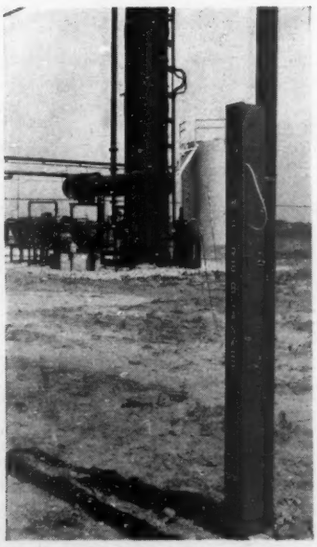
. . . that save $ $ $



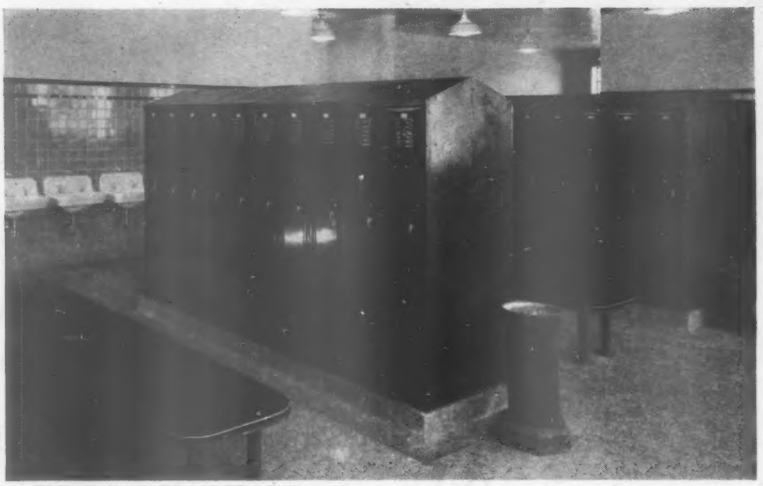
Yard Lines Supported Aboveground

A series of 4-in. pipe stringers set in concrete on welded legs extending about a foot above the surface of the ground, serve as the runway for pipe lines serving one refinery tank farm. These stringers are placed about 18 ft. apart and support steam lines as well as oil lines. This method of running the lines permits frequent painting to protect the lines from exterior corrosion. Also, if a leak develops from internal corrosion, the pipe can be quickly repaired by welding or the section can be quickly replaced. This method of support has the advantage of allowing refiners to use pipe of lesser wall thickness which is important now.

Fire Blanket At High-Pressure Absorber



Recognizing the need for personal protection of the operator against explosion and fire which might occur at equipment which is located some distance from the main plant, it is often found practicable to fill the need with a fire blanket rolled and stored in a box kept in a convenient place outside. The installation shown here provides for strapping the box to a pipe support. The protective box is fully weatherproof.

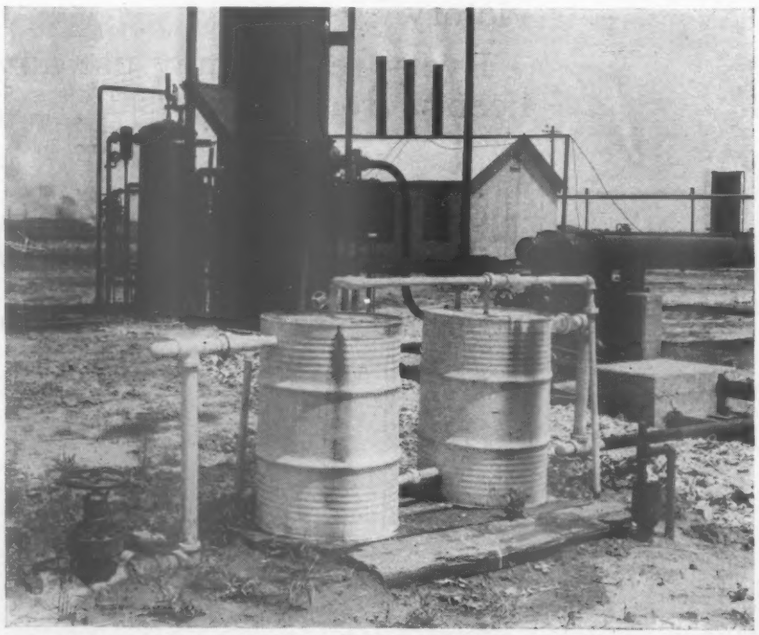


Sanitary Locker Room

It is not always practicable to install all the equipment needed to make a change and locker-room convenient, complete and sanitary without causing the expenditure of unreasonably large amounts of money considering the short time the room is in use. Here the company has come close to satisfying all these conditions. The smooth floor, wall and ceiling surfaces are easily cleaned and reflect maximum light. The lockers are raised off the floor to permit thorough cleaning around the base. The tops are sloping so that nothing can accumulate there to later attract dirt. The benches are wide and easily kept clean because of their slick finish. Individual wash bowls help to remove the industrial appearance of the room.

Old Oil Drums Used As Heat Exchanger Shell

The need for some heating became apparent when repeated freeze-ups occurred in the high-pressure gas line supplying fuel to a still. The gas came to the plant at 3,000-lb. pressure and was reduced to 40 lb. The plant operator solved this problem by utilizing two old oil drums as exchangers. He placed a spiral coil in each drum and connected these coils in series so the gas would pass through each. He then ran small steam lines through the top of each drum to a point near the bottom of each. In operation, a small quantity of steam was allowed to come into each drum and as it condensed, the drums were filled with water. As the drums continue in service a small quantity of condensate must be removed so overflow lines are provided.



then I said to myself—

Here's a NEW ANGLE On War Speed

Look how war industries can step up welding output with the new "Fleet-Fillet" Technique!

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"Fleet-Fillet" Bulletin 432 free on request.

THE LINCOLN ELECTRIC COMPANY
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¡ALTER EGO: Literally, "one's other self"—the still, small voice that questions, inspires and corrects our conscious action.

Progress in METALS

By W. L. NELSON

Performance of Sulfurized Cutting Oils

Abstract: "A Study of Cutting Oils With and Without Added Sulfur," by O. W. Boston and J. C. Zimmer before the October 1941 meeting of the Am. Soc. Metals. (Refer to Metals and Alloys, November 1941.)

FIVE oils were used in a study of effects on performance of cutting oils with and without added sulfur. These oils were designated as *A*, *B*, A_s, B_s, and $A + s$.

Oil *A* contained 0.10 per cent sulfur in its natural state, while oil *B* contained 2.03 per cent naturally occurring sulfur. Oils A_s and B_s were sulfurized products, using the base oils *A* and *B*, respectively. The fifth oil, $A + s$, was prepared by simply adding 1.6 per cent of an oil-soluble, synthetic sulfur compound to the 0.1 per cent natural sulfur content at 100° F., and mixing thoroughly.

The tests run with these oils were tool-life cutting-speed tests, drilling tests, and lubrication tests. In conjunction with these various experiments, the power required in turning was determined and the chip formation studied.

The test log used in the cutting-speed tool-life tests was a forging with an analysis to conform to an S.A.E. 3140 steel. The log was normalized and annealed; the tensile strength was 96,000 lb. per sq. in.; the Brinell hardness was 207. The tools used were of the 18-4-1 type of high-speed steel. Tool life was indicated by the complete breakdown of the tool.

In the drilling tests, four different steels were used: the S.A.E. 3140 steel, same as used for the cutting-speed tool-life tests; annealed S.A.E. 1020; annealed S.A.E. 1035; and cold drawn S.A.E. 1112.

From the tests the following conclusions were reached: In determining the tool-life cutting-speed relationship, a straight line on a log-log paper is obtained for each of the five oils and for cutting dry. The plots have equations of the type $VT^n = C$, where *V* is the cutting speed, *T* is the time for total tool failure, *n* represents the slope of the line from the horizontal, and *C* represents the vertical displacement of the line for a tool life of 1 minute.

By thermally sulfurizing the oil *B* with high inactive sulfur to give oil B_s, the performance factor is increased from the poorest to the best, at 5.1 per cent increase, and the tool life is increased 78 per cent. In the comparison of *A* to A_s, performance *C* is increased 2.2 per cent; tool life is increased 31 per cent. Comparing *A* to $A + s$, the speed is increased 3.3 per cent, and the tool life 47 per cent. The increase in the speed of the best oil B_s over that cutting dry is 5.5 per cent, while tool life increased 485 per cent.

The added active sulfur content values did not correlate with the relative cutting performance of the sulfurized oils.

High natural sulfur does not give high cutting performance, but seems to aid sulfurization to give a superior product. All tools failed in turning by the usual cupping process. All oils caused the chips to be formed in a normal way and the chips broke up into small pieces in a shorter time with the oils than when turning dry.

The drilling torque in S.A.E. 3140 steel is highest for cutting dry, reduced for plain oils *A* and *B*, and reduced further for the sulfurized oils. The drilling thrust is highest for cutting dry and lowest for the plain oil *A*. Torque and thrust values obtained for various oils in one steel do not necessarily have the same relation in another steel.

Oils containing high active sulfur showed a high load-carrying capacity. A low capacity was found for those oils with low active sulfur. The shock loading test seems to give the best correlation with cutting speed performance of the oils.

Do Not Abandon Alloy Steels

THE war emergency has produced a definite shortage of certain alloy elements, particularly those that are shipped from afar, but it has also produced a shortage in most other materials including plain carbon steel. Thus, if possible we should continue to use alloy steels for those services in which two or less pounds of alloy steel may, by its higher strength, be used to replace 3 lb. of plain steel. There is danger that we will be stampeded into an abandonment of alloy steels because some of the special alloy elements are scarce. It will of course be necessary to curtail the use of such strategic elements as chromium and nickel, as much as possible—but we can still use molybdenum, silicon, and for the time being, vanadium. Even this situation may change because of the probable expansion of many mines and plants, notably the nickel mines of Canada. Likewise we are making a serious effort to develop domestic manganese mines, and it is quite possible that this effort will be successful. What is needed is a wise use of all of our steel, both alloy and plain.

Salvage and Spoilage

ALTHOUGH metallizing has been long recognized as a method of salvaging worn plant equipment such as shafts, axles, plungers, piston rods, valve rods, etc., not much has been said of the use of metallizing in salvaging the many parts that are spoiled during manufacture by faulty machining. Normally a customer would require a shaft or axle that was entirely new, but in the present emergency many spoiled parts could be built up to the required dimension by the use of metallizing. Nor should such a repaired part be less useful than one which has not been metallized because it is entirely possible to select a metallizing material that is superior to the metal in the bulk of the piece.

Possible Use of Nickel Molybdenum Steel at High Temperatures

ALTHOUGH our supply of nickel is, at the moment, limited, it is an element that we can expect to get from Canada in whatever amounts are vitally necessary, by means of plant expansion. This is not so true of certain other elements such as chromium and hence we may wish to substitute the nickel molybdenum steels for the chromium molybdenum steels for certain high temperature services which require strength more than scaling resistance.

The creep data book published jointly by the American Society for Testing Materials and the American Society of Mechanical Engineers gives the values in Table 1 for short-time tests of S.A.E. 4615 in ⅞-in. rounds, normalized at 1,725° F. and temperatured at 1,200° F.

For slightly higher carbon, i.e., around 0.30 per cent with 2½ per cent nickel and 0.41 per cent molybdenum, Table 2 shows the values secured on approximately 1-in. rounds water quenched from 1,450° F. and temperatured at 1,050° F.

The data in Table 2 are short-time tests, and hence much lower strength values will result with appreciably lower loads applied over a period of time. At temperatures above 750° F., these steels are no longer truly elastic and will flow when subjected to very low stress. Information on stress to rupture for any particular long-time tests are not available, but for 1,000 hours at 1,000° F., the stress would be approximately 10 per cent of the short-time tensile strength.

TABLE 1—S.A.E. 4615, NORMALIZED AND DRAWN

Temp. (°F.)	Tensile strength (lb./sq. in.)	Yield stress 0.2% set	Proportional limit (lb./sq. in.)	Elongation in 2 in., %	Reduction in 2 in., %
85	72,425	52,500	47,500	37.5	70.1
750	65,250	32,750	24,500	28.75	69.6
900	52,000	30,375	14,500	25.75	77.3
1,000	43,500	25,500	8,000	25.0	81.5
1,100	33,500	18,875	6,500	30.5	80.2
1,200	24,775	12,000	4,250	59.25	79.9

TABLE 2—2½ PER CENT Ni-½ PER CENT Mo STEEL, QUENCHED AND TEMPERED

Temp. (°F.)	Tensile strength (lb./sq. in.)	Yield point	Proportional limit (lb./sq. in.)	Elongation of area, %	Reduction of area, %
70	154,600	143,000	80,000	20.0	62.0
300	146,200	128,000	72,000	17.0	59.6
550	148,050	121,000	80,000	26.0	70.8
800	120,000	99,000	38,000	19.5	75.1
1,000	95,250	51,000	16,000	20.0	84.6
1,200	35,300	6,000	.....	42.0	95.7

Not much is known of the creep strength of nickel molybdenum steel but in general the stress required to produce a 1 per cent creep in 100,000 hours at 800° F. is approximately 18,000 lb. per sq. in., and at 1,000° F. the stress would drop to about 3,000 lb. per sq. in. This type of steel is not usually recommended for temperatures exceeding 1,000° F.

Metal-Working Terms

Cutting, Grinding and Forming

There are general terms, each of which embraces a number of different types of operations. *Cutting* refers to an operation in which a single-point tool is applied to the work for the purpose of systematically dislodging metal from the surface of the material, and may involve such operations as drilling, planing, threading, reaming, or milling. *Grinding* is a similar operation in which a group of cutting points such as abrasive sand is applied over an area of the work, and may be illustrated by such operations as rough grinding with abrasive wheels, honing, lapping, or superfinishing. *Forming* operations involve deformation of the work by means of pressure and may be illustrated by such operations as rolling, drawing, stamping, piercing, or spinning.

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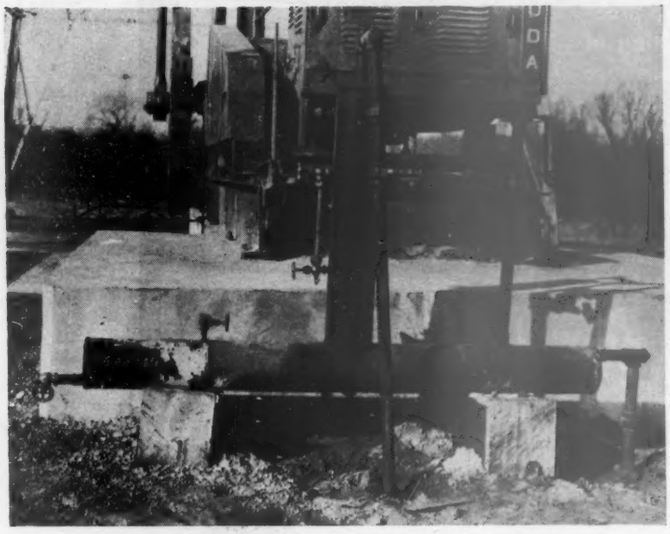


Volume Tank Filters Gas Through Oil

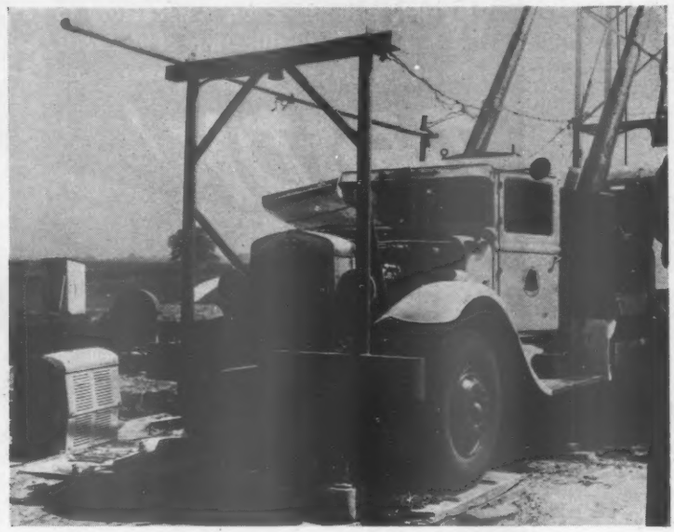
One operator using gas from the well to operate the pumping engines provides volume tanks in the shape of a T as shown. The object is to not only provide sufficient volume to insure smooth operation of the engine but to also remove the moisture from the gas before it enters the engine. The horizontal portion of the tank is filled with lubricating oil and most of the moisture is knocked out there. Some of the oil is carried over with the gas but it serves as a top lubricant in the engine.

Portable Pipe Straightener Kept With Rig

One drilling contractor operating in Oklahoma keeps a hydraulic pipe straightener with each rotary drilling rig. Special adjustable stands are also provided so the straightener can be easily set up and operated. These stands are made from old tubing of two sizes, one going inside the other. Perforations at 180° in each pipe allow the stand to be adjusted readily.

Leveling Jacks For Front of Drilling Unit

Portable units must be rigged up the same as standard-size rotary rigs. To protect the springs and the tires, suitable support must be provided for the frame of the unit. The accompanying picture shows the method used by one drilling contractor for supporting the front of the truck. The movable parts of two jacks are welded



to the front bumper and braced; a sill supports the base and the jack screws. The bases of the jacks are removed when the rig is prepared for changing locations.

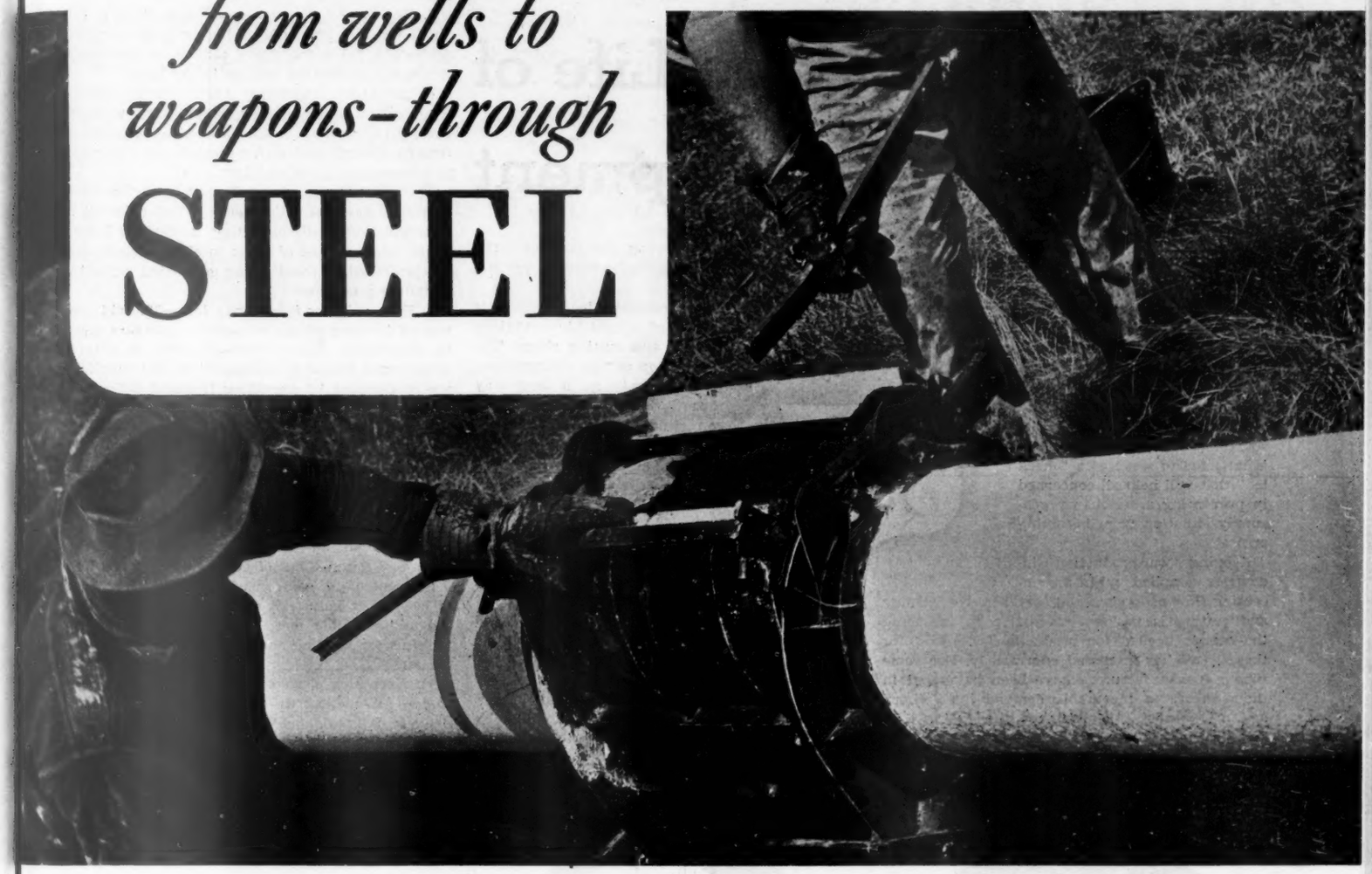
Blimp-Model Core a Curiosity

The 6-in. core shown in the accompanying photograph was cut from the Permian Big lime with a washover string during a fishing job in the Abell field of West Texas. Although the core has oil

inclusions it is nonproductive strata. Recovered more or less by accident in a Magnolia well, it is considered a curiosity because it is seldom that a core of this size and hardness is recovered.

A transfusion of fighting blood

from wells to weapons-through STEEL



Oil is the fighting blood of our ships, planes, tanks and trucks. Without it, our war power would lie stagnant. And to get it from wells to fighting forces is an operation that depends on Steel.

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Everyday Care Improves Efficiency and the Life of Oxyacetylene Equipment

IT is almost inevitable that in the rapid expansion of oxyacetylene welding and cutting, there should be a period when wasteful practices are prevalent. Furthermore, the wholesale addition of thousands of inexperienced operators has considerably aggravated this condition. There is no question that the conscientious welder or cutting operator is concerned about eliminating waste, when he knows its source. This article, therefore, is intended to serve as a "check list" that will help all concerned in preventing a serious oxygen-supply situation from becoming critical.

Keeping war-production industries supplied with an unceasing flow of oxygen and acetylene for welding and cutting is no less essential than providing the metals needed for production. Demand for these gases has increased enormously. For some time gas manufacturers have been hampered in their efforts to meet this demand by a shortage of cylinders to transport the gases. Now there has arisen another source of concern. The oxygen-production capacity of the oxyacetylene industry is being strained to the fullest extent in attempting to keep abreast of constantly pyramiding oxygen requirements. In spite of additions and expansions of oxygen and acetylene plants, a critical situation faces this industry—and all industries consuming these gases—unless efforts are made by everyone to conserve, particularly in the use of oxygen.

Check tip size. An oversize tip wastes gas. If number is not clear, check with cleaning drill

Keep your tips clean. Congested tips are inefficient, waste time and gas. Keep cleaning drills handy

A survey has revealed a considerable number of shop practices which might be disregarded in peacetime, but which today must be considered wasteful. These habits of yesterday, being largely unconscious, can be remedied only by a revaluation of the significance of such seemingly trivial practices as using the wrong size hose or torch tip, or opening up a full cylinder when a quarter-full cylinder stands idle.

The following list of recommended practices is based upon observations of correctable conditions in oxyacetylene welding and cutting shops. The elimination of wasteful practices will not only go a long way toward relieving the tight oxygen situation, and insuring an uninterrupted supply of gases, but will also prove economical to the individual shop where such conditions prevail. One shop, for example, was found to be unconsciously wasting approximately 25 per cent of its oxygen consumption, through an accumulation of "insignificant" losses.

1. *Use the proper size torch tip.* — A No. 2 tip used instead of a No. 1 for cutting ½-in. plate consumes 10 to 20 per cent more oxygen, 16 per cent more acetylene—all wasted.

2. *Do not use excessive pressures.*—This, one of the most common malpractices, is usually done by inexperienced operators who believe they thereby get a more efficient flame, or to save a trip to the pressure chart. Manufacturers' rated pressures are the most efficient for average conditions. And when more speed is desired the new high-speed machine cutting tips cut faster without consuming additional oxygen.

3. *Close cylinder valves when torch is not in use.*—If only the torch valves are closed, gas pressure in the hose rises and may force leaks. If leaks are already present or if new leaks are forced, considerable gas will be lost.

4. *Check hose and connections for leaks.*—They may be infinitesimal, but a 1/64-in. diameter leak in hose operating at 100 lb. will waste 290 cu. ft. of oxygen in 24 hours—more than a tankful. The hose should be checked periodically by immersing it in water while under pressure, to show up leaks. Soap and water will reveal leaks at connections.

5. *Use correct-diameter hose.*—Hose that is too small for the job requires higher gage pressure to secure sufficient flow, causing unnecessary strain and promoting leakage in the hose.

6. *Use short lengths of hose.* — Unnecessarily long hose also requires higher pressure, to overcome pressure drop in the hose. Also, the surplus lengths, though useless for the job, are subjected to unnecessary wear and tear.

7. *Use all the gas in each cylinder before connecting a new one.*—Use every cylinder for all it is worth before disconnecting it. In the larger shops interruptions of work to change tanks can be eliminated by manifolding gas cylinders, or by installing pipe lines.

8. *Keep cylinder inventories low.*—The old custom of keeping plenty of reserve cylinders must be abandoned, for it "freezes" them at a time when rapid turnover is imperative. Gas suppliers are cooperating by providing frequent deliveries. You can help by ordering fewer cylinders oftener, and by keeping reserves of cylinders at a minimum.

9. *Return empty cylinders promptly.*—Idle cylinders are production slackers.

10. *Don't leave torches burning when not in use.* It may seem troublesome to be constantly relighting the torch, but if it burns idly for even as little as 3 minutes out of each hour, it is wasting 5 per cent of its gas consumption. Five per cent of last year's industrial oxygen consumption was 360 million cubic feet. Let's use those 1,636,000 tankfuls for welding and cutting, not for heating the air.

11. *Keep tips clean and free from carbon and slag.* — An unclean tip is an inefficient tip, and, like any dull tool, is abhorrent to the skilled workman. Congested orifices nullify the value of using proper pressures and speeds, resulting in lower efficiency and consequent waste of gas.

12. *Don't abuse cylinders.*—A damaged cylinder must be taken out of circulation. It contributes nothing while undergoing repairs.

13. *Hose: handle with care.* — Because hose is made of rubber, it is most important that it be made to last as long as possible. To ensure this, it must be protected against mistreatment which promotes leaks. Therefore, keep hose out of range of hot oxide and sparks; wash off oil and grease, which ruin rubber; place a plank on each side of the hose where it crosses truck runways; store any hose stocks in a cool, dark place; and when a hose is damaged, cut out the bad portion and splice the ends together with standard nipples.

Essentially these suggestions involve but one basic concept — to uproot yesterday's habits to meet today's demand. None of the recommendations is difficult to accomplish, provided we open our eyes to everyday practices which should no longer be tolerated. Industry needs many waste wardens; they may be unofficial, they may be self-appointed, but if they watch out for wasteful practices among themselves and their coworkers they will be performing a very real service.

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CO$T Engineering

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

EVALUATION

JUNE 18, 1942

EFFECT OF PRORATION ON PAYOUT OF PRODUCING PROPERTIES

AT the present time the value of properties must be determined on the basis of what they will be allowed to produce. The present proration schedules in some cases turn what would be valuable properties into questionable ones. This article will not go into the merits of proration but will show that a property in Texas or Oklahoma, for example, must ultimately produce considerably more oil than a similar property in an unrestricted area such as Illinois. It will also point out that in the evaluation of properties, the proration schedule is one of the principal factors.

Proration Affects Decline

In the June 4 issue of The Oil and Gas Journal, Page 57, a discussion of the importance of the present worth factor was based on a particular property. This property was allowed to produce under only mild restrictions and consequently its decline was quite sharp; there were sufficient data available to estimate the decline.

When dealing with prorated properties the first difficulty arises in estimating the decline in productivity which is dependent on the rate of withdrawal. Proration can be so severe in some cases that the decline curve will be flat almost up to the time of abandonment. There is also the proration schedule to worry about as it will probably vary over the years. The future production during any coming year becomes more of a guess than the usual decline curve. It can be estimated on the facts at hand and the value of the property determined on that basis.

The accompanying tables are similar to those in the installment mentioned above and the conditions are the same except that the income from the property has been projected on the basis of production of 40,000 bbl. annually for 9 years, 30,000 bbl. during the tenth year and 28,000 bbl. during the eleventh year.

TABLE 1

Estimated production in 11 years (bbl.)	418,000
Less one-eighth royalty (bbl.)	52,250
Working interest (bbl.)	365,570
Estimated average price per bbl.	$1.21
Estimated value, working interest	442,349
Estimated lifting costs	52,080
Net income	390,269
Estimated salvage	15,000
Total income	405,269

Table 1 shows the estimated future production from the property during the 11 years; the total recovery during that time is 9,709 bbl. more than during the 6-year unrestricted period. The estimated value of the working interest is $10,070 more and the total net income, including salvage, is $8,262 more.

Lifting Costs Less

In Table 2 is shown the net income and the present worth at 6 per cent for each of the 11 years. Lifting costs were held steady during the first 7 years and then started to rise. However, due to proration, it could be expected that the lifting costs would be considerably less than during wide-open production. This table also includes the deduction for oil payments which were given in the June 4 issue as $9,900 out of one-eighth of the working interest and $50,000 out of three-sixteenths followed by $200,000 out of one-fourth of the working interest.

The estimated income from the purchase of the property for the 11-year period is shown in Table 3 to be $288,499, after the deduction of the necessary items. This has a present worth of only $216,029, or $33,634 less than at the more rapid rate of production. The salvage at the end of 11 years would necessarily be considerably less than at 7 years and is placed at $15,000, giving it a present worth of $8,115. This brings the total present worth to $224,144 which is $40,744 less than the income in the previous case.

On the basis of offering 60 to 70 per cent of the present worth of the income, the estimated purchase price becomes $134,486 to $155,900. This is $24,448 and $29,500 less, respectively, than when the rate of production was not restricted.

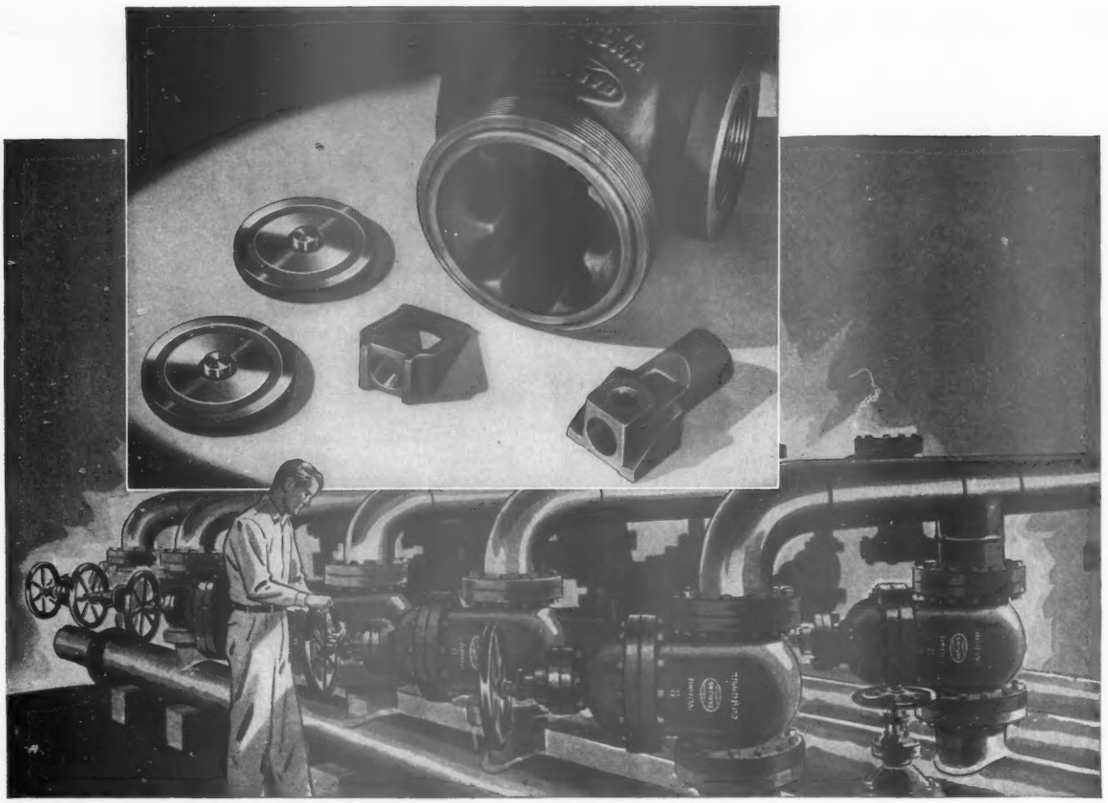
TABLE 3

Estimated income	$288,499
Present worth	216,029
Estimated salvage	15,000
Present worth	8,115
Total present worth	224,144

Estimated value for purchase based at 60 to 70 per cent of expected income is $134,486 to $155,900.

TABLE 2

Year ending:	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951
Production (bbl.)	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Royalty (bbl.)	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	3,750	3,500
Working interest (bbl.)	35,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	26,250	24,500
Value at $1.21 per barrel	$42,350	$42,350	$42,350	$42,350	$42,350	$42,350	$42,350	$42,350	$42,350	$31,762	$29,645
Estimated lifting cost per barrel	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.14	0.16	0.16	0.16
Operating expense	4,400	4,400	4,400	4,400	4,400	4,400	4,400	5,600	6,400	4,800	4,480
Net property income	37,950	37,950	37,950	37,950	37,950	37,950	37,950	36,750	35,950	26,962	25,165
Less oil payments	13,235	11,647	7,941	7,941	7,941	7,941	9,411	10,587	10,587	7,940	7,661
Net income	24,715	26,303	30,009	30,009	30,009	30,009	28,539	26,163	26,163	19,022	17,504
Present worth at 6 per cent	0.971	0.916	0.864	0.815	0.769	0.725	0.684	0.645	0.609	0.574	0.541
Net income at present worth	23,998	24,094	25,928	24,457	23,077	21,757	19,521	16,875	15,933	10,919	9,470



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Engineering Fundamentals

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL — No. 21

JUNE 18, 1942

GAS FLOW IN BRANCHING LINES

BY proper manipulation of Weymouth's formula, a special equation can be derived to apply to the solution of flow problems through a pipe line of uniform diameter having a number of offtakes. The same equation can be applied just as well to a pipe line of uniform diameter having a number of intakes and a common discharge. This special equation is

$$Q_e^2 = \frac{Q_1^2 L_1}{L} + \frac{Q_2^2 L_2}{L} + \ldots + \frac{Q_n^2 L_n}{L} \quad (1)$$

Where

Q_e = rate of flow through line from end to end that would produce the same overall pressure drop that actual divided flow produces.

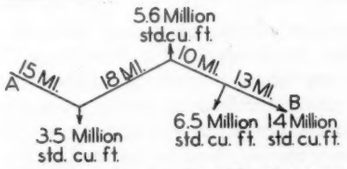
$Q_1, Q_2 \ldots Q_n$ = flow through each successive section of line, standard cubic feet per 24 hours.

$L_1, L_2, \ldots L_n$ = length of each successive section of line, miles.

L = total length of entire line, miles.

In applying the above formula to practical situations the equivalent rate of flow, Q_e, is calculated and then substituted in the original form of Weymouth's equation given in Installment 17. Problems can be handled where any one of the three following variables is the unknown: Input pressure, outlet pressure, internal diameter of the pipe.

Example 1.



Problem.—A pipe line 56 miles long is delivering gas to four different points as shown in the sketch. Location of the offtakes and amount of gas to be taken off per 24 hours at each point are shown on the sketch. Pressure at A is to be 600 lb. per sq. in. abs. Pressure at B is to be 64 lb. per sq. in. abs. Specific gravity of the gas is 0.65. Flowing temperature is 80° F. Calculate the size of line of uniform diameter that should be used.

Solution.—Substituting in Equation 1,

$$Q_e^2 = \frac{(29{,}600{,}000)^2\,15}{56} + \frac{(26{,}100{,}000)^2\,18}{56} + \frac{(20{,}500{,}000)^2\,10}{56} + \frac{(14{,}000{,}000)^2\,13}{56}$$

$$= 234.6 \times 10^{12} + 218.9 \times 10^{12} + 75.06 \times 10^{12} + 45.49 \times 10^{12}$$

$$Q_e^2 = 574.05 \times 10^{12}$$

$$Q_e = 23.96 \times 10^6, \text{ or } 23{,}960{,}000 \text{ std. cu. ft. per 24 hours.}$$

Substituting in Weymouth's equation (given in Installment 17),

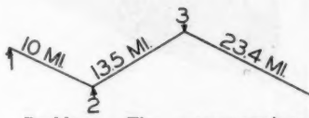
$$23{,}960{,}000 = 15{,}302 \times d^{2.667} \times \left[\frac{(600)^2 - (64)^2}{56 \times 0.65 \times (460 + 80)}\right]^{1/2}$$

$$23{,}960{,}000 = 15{,}302 \times d^{2.667} \times 4.26$$

$$d^{2.667} = \frac{23{,}960{,}000}{15{,}302 \times 4.26} = 367.$$

Referring to Table 1, Installment 17, it is found that $d = 9.2$ in.

Example 2.



Problem.—The accompanying diagram represents a pipe line of uniform diameter which is to be laid to take gas from points 1, 2, and 3 and deliver it to point 4. Rates at which the gas is to be introduced, in standard cubic feet per 24 hours, are:

At point 1, 15,000,000
At point 2, 10,000,000
At point 3, 8,000,000

The gas will be introduced at point 1 at 515 lb. per sq. in., abs., and will be delivered to point 4 at 75 lb. per sq. in., abs. Specific gravity of the gas is 0.715. Flowing temperature is 60° F.

Determine the diameter of line required, and calculate the input pressures that should be used at points 2 and 3.

Solution.—Substituting in Equation 1,

$$Q_e^2 = \frac{(15{,}000{,}000)^2\,10}{46.9} + \frac{(25{,}000{,}000)^2\,13.5}{46.9} + \frac{(33{,}000{,}000)^2\,23.4}{46.9}$$

$$= 47.97 \times 10^{12} + 179.87 \times 10^{12} + 543.3 \times 10^{12}$$

$$Q_e^2 = 771.14 \times 10^{12}$$

$$Q_e = \sqrt{771.14 \times 10^{12}} = 27.77 \times 10^6$$

$$= 27{,}770{,}000 \text{ std. cu. ft. per 24 hrs.}$$

Using the original form of Weymouth's equation from Installment 17,

$$27{,}770{,}000 = 15302 \times d^{2.667} \times \left[\frac{(515)^2 - (75)^2}{46.9 \times 0.715 \times 520}\right]^{1/2}$$

Solving, in the same manner as in Example 1,

$$d^{2.667} = 470.52$$

And, from Table 1, Installment 17, $d = 10.02$. (Actually the diameter is very slightly greater than 10.02 in., but this standard size should be satisfactory.)

The proper pressure for point 2 can be easily calculated by applying Weymouth's formula to the section of line between points 1 and 2 as follows:

$$15{,}000{,}000 = 15{,}302 \times (10.02)^{2.667} \left[\frac{(515)^2 - P_2^2}{10 \times 0.715 \times 520}\right]^{1/2}$$

squaring both sides

$$(15{,}000{,}000)^2 = (15{,}302)^2 \times (467)^2 \left[\frac{(515)^2 - P_2^2}{10 \times 0.715 \times 520}\right]$$

Solving, $P_2 = 499$ lb. per sq. in. abs.

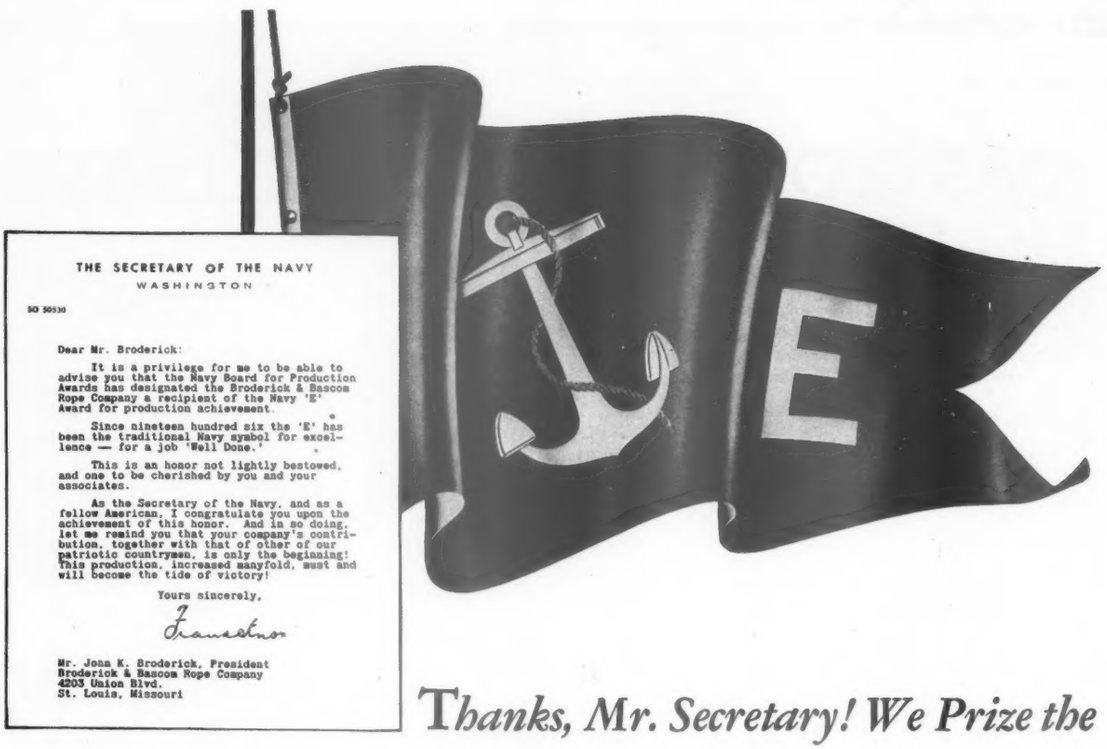
To calculate the proper input pressure at point 3, the section of line between points 2 and 3 may be used in a similar manner to that just used for calculating the pressure at point 2, using 499 lb. per sq. in. as the inlet pressure to the section, 25,000,000 std. cu. ft. per day as the flow rate, and 13.5 miles as the length of line. Another method of arriving at the same result consists of starting with the known pressure at point 4 and working back, considering the 23.4-mile section of line, to obtain the pressure at point 3.

The latter method, being slightly different, will be used. Substituting in Weymouth's formula, applied only to the 23.4-mile section,

$$33{,}000{,}000 = 15{,}302 \times (10.02)^{2.667} \left[\frac{P_3^2 - (75)^2}{23.4 \times 0.715 \times 520}\right]^{1/2}$$

Solving, $P_3 = 437$ lb. per sq. in. abs. which is the proper input pressure at point 3.

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma



THE SECRETARY OF THE NAVY
WASHINGTON

SO 30530

Dear Mr. Broderick:

It is a privilege for me to be able to advise you that the Navy Board for Production Awards has designated the Broderick & Bascom Rope Company a recipient of the Navy 'E' Award for production achievement.

Since nineteen hundred six the 'E' has been the traditional Navy symbol for excellence — for a job 'Well Done.'

This is an honor not lightly bestowed, and one to be cherished by you and your associates.

As the Secretary of the Navy, and as a fellow American, I congratulate you upon the achievement of this honor. And in so doing, let me remind you that your company's contribution, together with that of other of our patriotic countrymen, is only the beginning! This production, increased manyfold, must and will become the tide of victory!

Yours sincerely,

Frank Knox

Mr. John K. Broderick, President
Broderick & Bascom Rope Company
4203 Union Blvd.
St. Louis, Missouri

Thanks, Mr. Secretary! We Prize the

NAVY "E" AWARD *for Excellence*

...and We Rededicate Ourselves to the Service of America

In a recent message, the Secretary of the Navy informed the Broderick & Bascom Rope Co. of its selection to receive the coveted Navy "E" Award. This honor—symbolized by the Navy "E" burgee, a pennant bearing the anchor and "E"—is official recognition of outstanding performance in production.

To Navy men and their ships, since 1906, the letter "E" has literally stood for "Excellence" in a task assigned; winning it has been a much-sought mark of distinction. Now bestowed upon industry for special achievement in serving the Navy, the "E" is properly shared by the plant and all its employees. The new Navy "E" pennant flies near our American Flag, and individual employees proudly wear "E" lapel buttons.

In acknowledging this award, with deepest thanks, the Broderick & Bascom Rope Co. appreciates that it carries the obligation to surpass past records today and in the future. Through times of peace and war, since 1876, we have given our best to the manufacture of wire rope for the nation and its industries. At this new milestone we again dedicate our full energies and resources to the cause for which America fights and the Victory that will be won.

Broderick & Bascom Rope Co., St. Louis

Manufacturers of Yellow Strand Preformed Wire Rope

Branches: New York, Chicago, Houston, Portland, Seattle • ***Factories:*** St. Louis, Seattle, Peoria

Journalog

A FEATURE OF THE OIL AND GAS JOURNAL

No. 9

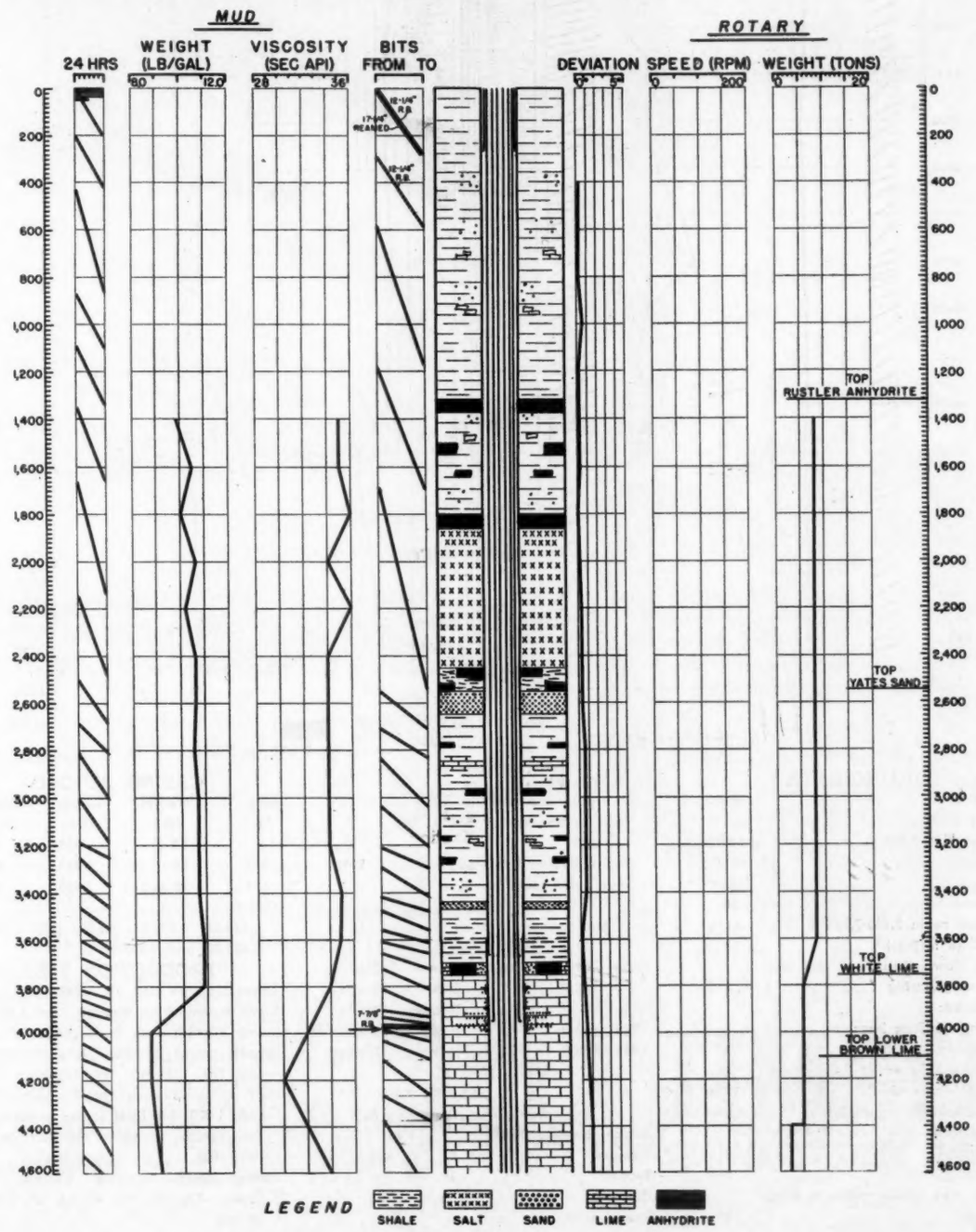
JUNE 18, 1942

PHILLIPS PETROLEUM CO. 2 UNIVERSITY-ANDREWS

COMPANY TOOLS

1,980 ft. E line and 660 ft. S line 30-Block 10, Andrews County, Texas.

Discovery of Ellenburger Production in the M-Bar Field, West Texas



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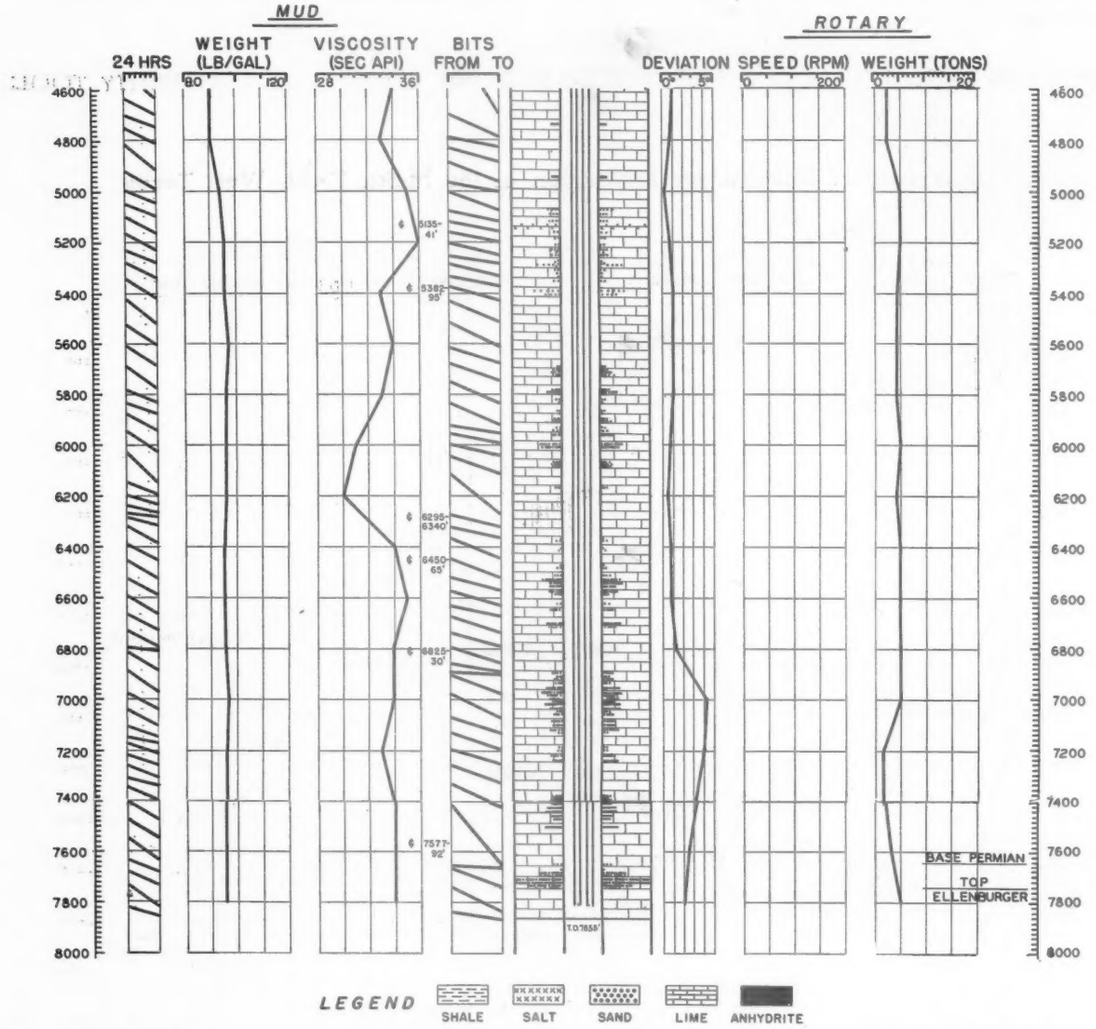
Journalog

Discovery of Ellenburger Production in the M-Bar Field, West Texas (Continued)



DRILLING DATA

Moved in	12-20-41
Started drilling	12-23-41
Reached T.D. 7,855 ft. on	4-30-42
Elevation	3,246 ft.
	Days
Drill and ream 0-3,968 ft.	24
Drill and ream 3,968-7,855 ft	51¼
W.O.C. (3 strings)	10
Laying down drill pipe and running casing	2¼
Shut down:	
Change drilling lines	1
Christmas	1
Replace draw works (after setting 9⅝-in. casing	14½
Miscellaneous repairs	1
Fishing time:	
Twistoffs	6
Cones	2½
Stuck pipe (while testing at 6,255 ft.)	10½
Miscellaneous:	
Coring and circulating	4½
Electric log	½
Drill plug and wash in	1
Test (before setting 5¾-in. casing)	5¾
Run tubing and test pay	12½
Tear down tools	1
Total days on location	141

BITS USED

From	To	No.	Type	Size
0-	282 ft.	1	R. B.	12¼-in.
		1	Ream	17½-in.
282-	3,968 ft.	22	R. B.	12¼-in.
3,968-	7,855 ft.	52	R. B.	7⅞-in.

MUD USED*

	Surface	282-3,968 ft.	3,968-7,855 ft.
Hopper clay	200	..	...
Aquagel	30	34	526
Zeogel	...	56	...
Fibertex	...	..	20
Marco mud	...	..	81

*Sacks except Fibertex which is in bales.

CASING RECORD

Size (in.)	Weight (lb.)	Depth (ft.)	Cement (sacks)
13	50	265	465
9⅝	36	3,952	600
5½	15 and 17	7,805	500

Cored: 5,135-41; 5,382-95; 6,295-6,340; 6,450-65; 6,825-30 and 7,577-92 ft.

PRODUCTION TEST

Date: May 14 and 15, 1942.

Time flowed: 6 hr. through open 2-in. tubing; 9 hr. through ½-in. choke.

Hourly gages (flowing through tubing): 122, 122, 122, 122, 113, 122 bbl.

First tubing pressure 820 lb.; casing pressure 1,020 lb.; final tubing pressure 90 lb.; casing pressure 720 lb.; gas/oil ratio 605.

Hourly gages (flowing through ½-in. choke): 70, 100, 70, 70, 55, 88, 87, 78, 83 bbl.

Final tubing pressure 480 lb.; casing pressure 820 lb., gas/oil ratio 636.

We're Elevating Temperatures

TO ASSURE VICTORY
BUY UNITED STATES WAR SAVINGS BONDS & STAMPS

Today you are asking for seamless steel tubing capable of withstanding temperatures of 1500°F. and more.

We are producing such steel now because we put a staff of research engineers and metallurgists to work years ago and asked them to find steel compositions that would meet these specifications.

These men have elevated the service temperatures of seamless steel tubes 500°F. in the last few years and they're still hard at work improving these compositions.

We're not bragging when we say that we have for years maintained the most consistent high temperature program in effect anywhere. It's simply a matter of record.

You can draw from this wealth of experience to solve your own high temperature problems. Simply write or phone us today, without obligation.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO
Steel and Tube Division

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
SEAMLESS STEEL TUBES

Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; and Timken Rock Bits.

Weapons of War

on the home front

*A.M.** keeps 'em rolling

Tanks, guns, planes and ships are not the only weapons of war! Service tools, inspection instruments, good service shop equipment in the hands of trained mechanics are weapons of war on the home front—weapons essential to Victory! For these are the tools that "keep 'em rolling"—to move men, materials and finished products where they are needed most. Your trucks, trailers, buses or trolley buses must be safeguarded and maintained now, not only to keep your equipment in service and operating costs down, but to keep every piece of equipment in the front line of duty—for Victory! Good A.M. (Axle Maintenance*) is the "ounce of prevention" that will save many a "pound of cure" for vital transportation equipment that must be kept on the job for the duration. Timken has some valuable free A.M. aids for you. Write for them today!

TIMKEN AXLES

THE TIMKEN-DETROIT AXLE CO., DETROIT, MICHIGAN
WISCONSIN AXLE DIVISION, OSHKOSH, WISCONSIN

Timken's Job: To Axe the Axis with Axles

REFINERY ACTIVITY AND EXPANSION

Sulfur Specifications For Motor Fuel Scored by W.P.R.A. Refinery Group

SHREVEPORT, La. — The virtues and evils of some of the specifications which must be met in the normal process of refining petroleum products were discussed at the regular bimonthly meeting of the Ark-La-Tex group of the Western Petroleum Refiners Association here last week.

Chairman of the Shreveport meeting was J. K. MacKinnon, manager of Talco Asphalt & Refining Co. The symposium was divided into two sections. Gasoline specifications were discussed by A. W. Trusty, chief chemist, Arkansas Fuel Oil Co., and lubricating-oil specifications were discussed by H. J. Sheard, superintendent, Bayou State Oil Corp.

Specifications are necessary from the viewpoint of the refiner, as well as the salesman and consumer, to maintain uniformity of products and to insure the use of the correct material for the particular commercial application which it is called upon to perform. However, the refiner, speakers declared, should not be hampered with unnecessary or meaningless requirements, because eventually the consumer will have to pay for the increased refining expense.

Most Specifications Arbitrary

Most of the petroleum specifications are adopted, not from a consideration of scientific data, but from an arbitrary figure that has been arrived at through practice or custom. The sulfur specification has a typical case history. The federal Specification Products Board about 1920 set up a maximum sulfur content requirement of 0.1 per cent in motor gasoline. The figure of 0.1 per cent was adopted because practically all of the motor fuel on the market at that time was straightrun gasoline with a sulfur content less than the maximum specified. The high sulfur fields of West Texas, Wyoming and California had not been discovered at that time, and cracking was in its early stages. No scientific evidence was available to prove that a sulfur content over 0.1 was harmful to motors.

As the several states began to adopt gasoline inspection laws, the specifications as set up by the federal Government were adopted in toto in many cases. Today 13 states have a maximum sulfur content specification of 0.1 per cent; one state has 0.15 per cent and five states have 0.20 maximum sulfur for motor fuel in their laws. There is an outstanding lack of uniformity among the various states in regard to this sulfur specification. For example, Georgia very rigidly enforces the 0.1 per cent maximum sulfur specification whereas her neighbor, Alabama, has no sulfur limitation.

High-sulfur gasoline has been sold in California for the past 15 years. In a recent survey of the regular-grade gasolines sold in that state, only four out of 27 contained less than 0.1 per cent and nearly half had over 0.2 per cent sulfur. The four highest sulfur contents were 0.45, 0.37, 0.28, and 0.27 per cent. The third-grade gasoline contained as high as 0.63 per cent sulfur. The complaints of engine corrosion from automobile owners is no greater in California than in other parts of the United States. Wyoming authorities, where high-sulfur gasoline is marketed, are reported to have no reason to believe that the present 0.2 per cent maximum sulfur specification is too high. It is estimated that the cost to the refiner to reduce the sulfur content of all gasoline to below 0.1 per cent would run into millions of dollars annually. The recent adoption of a 0.25 per cent maximum sulfur content for motor fuel by the federal Government perhaps will be a step in the direction of raising or elimination of the 0.1 requirement now in effect in many cases.

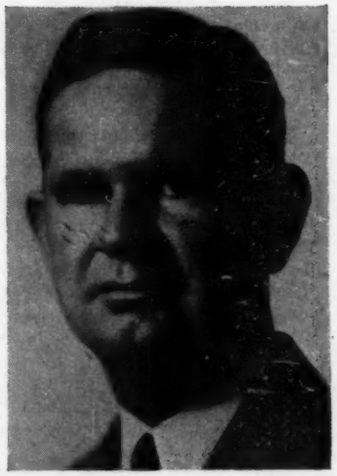
The volatility specifications on gasoline are almost as varied in number as the number of purchasing agencies. One major company stresses the importance of the initial boiling point. Another gives a 5° F. maximum allowable boiling range for the 10 per cent point. A study of a number of commercial specifications for the distillation range of motor fuels reveals that there are in most cases an excessive number of distillation points specified, and, the boiling range required is a very narrow fraction, allowing little variation. Sufficient experimental work has been done by agencies such as the Bureau of Standards, Dr. Brown at the University of Michigan, the Natural Gasoline Association of America and others, to conclude that as far as volatility is concerned, a specification for the 10, 50 and 90 per cent distillation point together with a vapor-pressure specification is sufficient, and the inclusion of any other points is superfluous. The volatility specifications as set up for federal Government motor fuel were suggested as ideal, containing only the essentials to indicate performance and no meaningless and unnecessary requirements.

Doctor Test Sensitive

The doctor-test specification has persisted through the years in a manner similar to the sulfur specification. The doctor test indicates the presence of mercaptan sulfur compounds. The test is very sensitive. As little as 0.0005 per cent mercaptans can be detected by this reagent. In some cases then it is necessary for the refiner to chemically treat his entire production of gasoline simply for the aim of meeting the "doctor" specification, when a caustic wash, or some other simple treatment would have produced a gasoline with practically the same odor. The light molecular-weight mercaptans have an evil odor. However, some of the heavy molecular-weight mercaptans are odorless. Since doctor treatment always results in an increased tetraethyl-lead requirement and lower octane number, the question was raised as to the wisdom of such a specification. Caustic washing will remove 75 per cent or more of the mercaptans from a gasoline and will attack the light molecular ones with the worst odors. Doctor treatment does not lower the total sulfur content but converts the mercaptans to another odorless form of sulfur.

An alternate specification for the doctor test has been suggested and seems to be much more practical and indicative of quality: "That the maximum mercaptan content shall not exceed 0.008 per cent (or higher) and no more than 10 per cent of which can be removed by a 10° B. caustic wash." Thus a gasoline would be rid of

Sketches of Plant Operators . . .



JAMES W. VAIDEN, vice president in charge of manufacturing for Skelly Oil Co., is finding abundant use for his education and practical application of chemical engineering in this era of aviation gasoline, synthetic rubber and explosives produced from petroleum hydrocarbons.

Refineries and natural-gasoline plants under Mr. Vaiden's supervision are producing several of the raw materials that eventually find their way into aviation motor fuel and other synthetic compounds. Further exploration of the possibilities in the production of petroleum-hydrocarbon chemicals is engaging the full interest of Mr. Vaiden and members of his manufacturing organization.

Mr. Vaiden came to the Mid-Continent oil country in 1924 and after working 3 or 4 months as a laborer for Mid-Kansas Oil & Gas Co., joined the Skelly organization. He advanced from a common laborer to line walker, stillman, plant chemist and eventually was made superintendent of the Skelly plant at Stroud, Okla., probably the first charcoal absorption installation made in the Mid-Continent. Later, he was made superintendent of other Skelly plants at Coleman, Tex., Wynona and Seminole, Okla.

He was moved to Tulsa as assistant superintendent of the natural-gasoline department in 1930 and 4 years later became head of that division. He was elected vice president of the company and given charge of all manufacturing operations, including refineries and natural-gasoline plants in several states.

Mr. Vaiden was born in Alabama in 1897 and attended Marion Military Institute before the first World War. When he become 21 while attending officers training school at Camp Taylor, Ky., Mr. Vaiden was commissioned a lieutenant in the 117th U. S. Field Artillery. He reentered Alabama Polytechnic Institute after being discharged from the Army and graduated from that school with a degree in chemical engineering. Before entering the oil industry, Mr. Vaiden spent 2 years teaching school and coaching football and baseball at high schools in Alabama and Louisiana.

most of the odorous mercaptans, would be still positive to the doctor test, but would save the refiner and the motoring public millions of dollars a year without any sacrifice in quality of the motor fuel.

Gum tests were discussed. It was the consensus that the copper-dish gum test was indicative of quality when used for that purpose. A low copper-dish test with a 5-hour induction period will indicate a more stable gasoline in storage than will a high copper-dish gum test with the same induction period. The method of test for making the copper-dish gum determination has not been standardized by the A.S.T.M., and the results obtained by various laboratories will fluctuate in some cases by 200 or 300 per cent. For this reason it was felt that the test should be used only by the refiner as a means of plant control, while the sales people should use only the standardized preformed and induction-period tests.

John Day, secretary of the Western Petroleum Refiners Association, who has recently spent considerable time in Washington, told of the efforts of the OPC to aid the small refiner by enlisting his efforts in the production of butadiene. The plan in general was to set up butadiene conversion units in as many of the small plants as was possible and practical and to ship the crude butadiene to a central plant for extraction.

There was a lively discussion of some of the merits of lubricating-oil specifications, but no general recommendations or suggestions were made toward the elimination or modification of any of the existing requirements.

•

Increased Production of Synthetic Rubber Components Urged by OPC

WASHINGTON, D. C.—Plans for greater production by the oil industry of raw materials for the manufacture of synthetic rubber have been put under way by the Office of Petroleum Coordinator.

In Petroleum Directive 52, the OPC called on the industry, through the Petroleum Industry War Council and the various OPC industry committees, to make an immediate comprehensive survey of the possibilities of increasing the output of synthetic-rubber ingredients without impairing the production of other war products of the industry. The directive also asks that all plans and programs for increasing production be submitted to the OPC and put into operation as soon as possible.

Civilian Supply Indefinite

While these plans are expected to result in greater production of synthetic rubber at an earlier date than now scheduled, no promise is held out that such rubber will be available for civilian tires in the near future because of the huge military demands.

In announcing the program, Deputy Coordinator Ralph K. Davies said:

"Since the severance of this nation from the major portion of its source of supply of natural rubber, the need for instituting and expanding programs for the production of raw materials to be made into synthetic rubber has become increasingly pressing.

"It appears likely that the petroleum refining industry can satisfy this need in substantial measure by the application of various processes to existing operations, the use of available charging materials, and the maximum utilization of existing equipment, without impairment of the production program for other war products."

Mr. Davies made clear that the OPC and the oil industry are doing what they can to contribute as much raw material as possible for the refining of synthetic rubber at the earliest possible date. The utilization of existing equipment will greatly aid in both the time and saving of critical construction materials.

Technical Data Available

OPC's Refining Division has been exploring the problem with technicians of the industry during the past few weeks and has already received several encouraging reports. Technical details and all information gathered will flow to the refining centers for use by both large and small refiners wherever application can be made.

The directive calls for reports that will show the progress being made in the survey. Whenever the investigation has progressed sufficiently, plans for the production of raw materials for synthetic rubber may be submitted to the director of refining for the approval of OPC.

When a production plan is found acceptable by the Office of Petroleum Coordinator, the member or members of the petroleum refining industry submitting it shall carry on negotiations with OPC regarding agreements for the production and sale of the raw materials.

•

Louisiana May Repeal Refinery Tax to Attract New Plant

BATON ROUGE, La.—The Louisiana petroleum-refining tax of 1 cent per barrel would be repealed if plans for a 50,000-bbl. refinery at Lake Charles, La., are consummated, according to a bill passed here last week by the house of representatives.

Rep. Gilbert H. Graham, of Lake Charles, sponsor of the bill repealing the refining tax contingent on the construction, told the house that Cities Service Oil Co. would build a $75,000,000 to $100,000,000 refinery near this city if the legislation was enacted. He said the plant would be built in Texas if the 1-cent tax stayed on the statute books.

Consumers Coperative Votes Alcohol-Research Fund

NORTH KANSAS CITY, Mo.—A 5-year program of cooperative research calling for an expenditure of $10,000 a year was voted unanimously by directors of Consumers Cooperative Association at a meeting this week in Scottsbluff, Neb., it was announced from headquarters here by Howard A. Cowden, president. Directors voted at the same meeting to build a plant for making alcohol from farm products, and dedicated the refinery there which was purchased last December from Terry Carpenter, Inc.

Mr. Cowden said technical men will be engaged to carry on experiments in the production of synthetic rubber, using alcohol from farm products as a base. Another problem, he pointed out, will be that of lowering the cost of alcohol for blending with gasoline in order to improve octane rating. In carrying on these and other experiments, he said, other cooperatives and agencies friendly to cooperatives will be asked to participate in the program.

"We are finding that the petroleum industry, and agriculture, are becoming chemical industries more and more. Cooperative leaders long have felt the need of a research organization which would use and supplement information now obtainable from public agencies, such as the regional laboratories of the U. S. Department of Agriculture, the Bureau of Mines, the Bureau of Standards, and the laboratories of land-grant colleges," Mr. Cowden said.

"Even though we are entering the field of research, we still want to see our patent laws amended in the interest of consumers. High royalties in many fields are being continued long after the cost of the process has been liquidated. It tends to make goods costlier and is an unnecessary drain on consumers. Inventions and discoveries should either be given to the people royalty free, just as Babcock gave the milk tester to the dairy industry, or patent protection should be ended after the inventor or discoverer had been granted reasonable compensation."

The North Kansas City cooperative now operates a petroleum laboratory at headquarters and one each at its refineries in Phillipsburg, Kans., and Scottsbluff, Neb.

Pure Promotes Three In Refinery Division

CHICAGO, Ill.—Three promotions in Pure Oil Co. refinery managerial posts were announced this week by J. Porter Langfitt, assistant to the vice president in charge of refining. The new assignments became effective June 15.

At the Marcus Hook, Pa., refinery, Edmund A. McCadden, present superintendent, has been appointed manager of terminal and manufacturing operations. Mr. McCadden has been in the Pure organization since July 1, 1906.

Another native Pennsylvanian, James C. Megraw of Charleston, W. Va., present superintendent of the Cabin Creek, W. Va., refinery, was promoted to superintendent at Marcus Hook. Mr. Megraw started work with Pure on March 15, 1912, in the refinery to which he is now returning as superintendent.

Mr. Megraw is succeeded as superintendent of Cabin Creek refinery by David S. Frank, of Chicago, a member of Pure's refinery control board, who has just completed his eleventh year with the company.

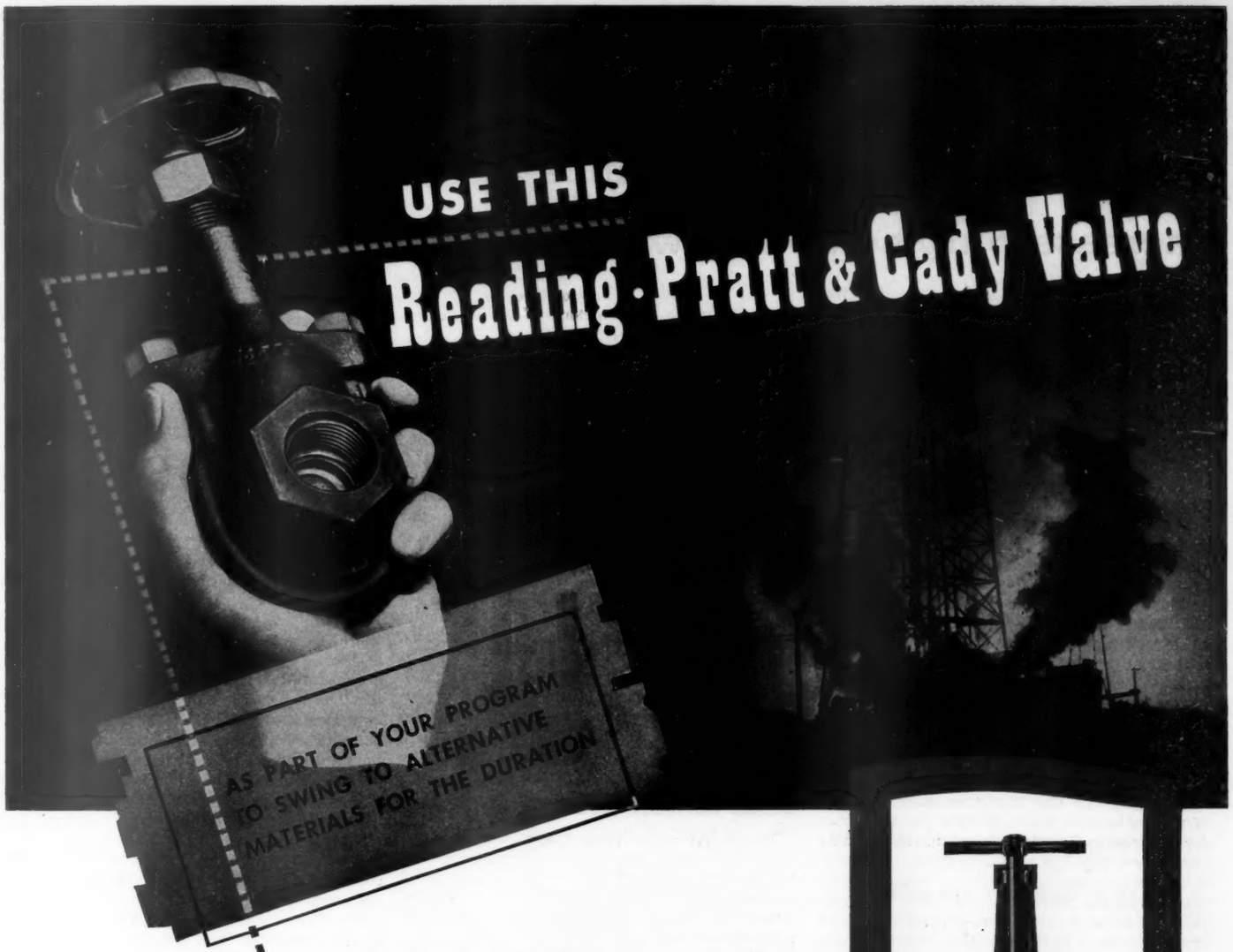
California Refinery Will Improve Gasoline Quality

LOS ANGELES, Calif.—Mohawk Refining Co., Bakersfield, Calif., has been extended a loan of $2,500,000 by the federal Government for the purpose of installing processing equipment that will improve its yields of aviation gasoline.

Equipment to be installed, under terms of the loan, will qualify the Mohawk refinery, one of the largest in Kern County, California, to produce 100-octane gasoline.

Canadian Plant Will Adapt Refinery Gas to Natural System

SARNIA, Ont.—The new processing and purification plant to adapt residual gas from the Imperial Oil, Ltd., refinery for distribution through the natural-gas system of the Union Gas Co. will, it is expected, be in operation early in October. In addition to the processing plant, a gas holder of 400,000 cu. ft. capacity is being erected to increase the Union company's reserves. Storage of surplus gas from the processing plant in the partially depleted sands of the Dawn gas field will be undertaken later.

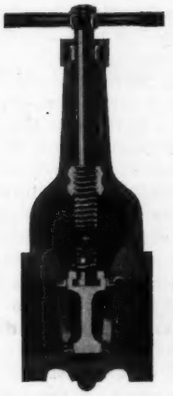


★ Wherever you need Gate Valves of any size—*even smaller sizes*—turn your thoughts away from bronze bodies. The increasing war tempo has placed the supply of brass and bronze in an even more critical position.

You will be much more likely to get delivery if you use, as an alternative, valves with bodies of P&C High Test Iron.

If bronze trim is imperative, the spindle will be of P&C High Tensile Rolled Bronze. The Follower, cast-in bonnet bushing, renewable seat rings and reversible I-beam wedge will be P&C Special Valve Bronze. That sounds like a great deal of critical material. Actually, it represents scarcely ¼ of the total weight of the valve.

Bear in mind, of course, that, even where it is possible to obtain release of materials for you, deliveries are subject to the fact that in this plant the needs of America's Army and Navy—and those working directly on war production—have first call. We are doing everything within our power as manufacturers of valves and fittings to speed the day when Victory brings Peace.



P&C Figure 122-C
Iron Body Clip Gate Valve

Bronze mounted and all iron. Working pressures; 150 lbs. of steam; 225 lbs. OWG. Sizes; ¼" to 3".

Note the round bonnet which permits use of male and female bonnet joint with asbestos gasket and which assures tightness. Full U-Bolt equalizes pressure on both sides. Body guide lugs and closed bonnet eye-lugs prevent slippage. Heavy I-beam wedge. Full size body guides for wedge. P&C assembly of spindle and wedge provides great strength. Bonnet bushing is cast in.

ACCO

READING·PRATT & CADY

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Pipe-Line Activity

Big Line Project Offers Chance to Increase Shipments Eastward

WITH the granting of approval by the War Production Board for the construction of a 24-in. pipe line from Longview, Tex., to Salem, Ill., an important step has been taken toward providing means for "increasing the supply of oil to the East Coast within 6 months."

An article on the 550-mile Longview-Salem project appears elsewhere in this issue.

In the 10-project program which has been studied by government and pipe-line officials this year, the East Texas-Salem, Ill., project was given special consideration as the first step toward obtaining a trunk line to the East. In the later plans for the East Texas-Salem line, the diameter of the pipe was increased from 22-in. to 24-in.; plans for a line from Salem, Ill., to the East Coast called for 24-in. in both last year's and this year's program.

The entire East Texas-Salem-East Coast line was conceived, according to plans drawn this spring, as a 1,400-mile project. This was the original National Defense Pipe Line Project of last summer but which was not built because of repeated refusals of the Government to sanction the use of steel. In the plans made this spring, the diameter of the East Texas-Salem section of the line was increased in order to compensate for declines in Illinois production. In planning the project, pipe-line men appreciated that such a big line starting in East Texas would be connected with the network of the whole of Texas. It was estimated then that the whole project from East Texas to the East Coast would require 422,000 tons of new steel for 24-in. In addition the requirements for electric centrifugal pumps and other equipment, would bring steel tonnage for the line up to 450,000 tons. A year was believed to be necessary for building the line all the way to the coast. When originally planned, the cost was estimated to be less than $70,000,000. With increased costs owing to war conditions this year, it is said that cost of the entire project might approach $100,000,000.

Last August, an aerial survey was completed for the entire route. Surveying for the route was done in congested areas of Pennsylvania and New Jersey by local engineering firms which were familiar with the location of existing gas, water and power lines. Furthermore, considerable checking of aerial surveys was done on the ground particularly in the Ohio section.

A comparison between tanker transportation and transportation through the big line shows that steel for the line to the East Coast is four times what has been needed for equal carrying capacity of tankers operating under peacetime conditions between the Gulf Coast and the New York Harbor area. But in war when tanker deliveries are reduced because of regulations calling for daylight operations, changes in course and interruptions in service, tankers actually have more steel per barrel of oil delivered than would be required for the big pipe line. Although it has been claimed that steel could not be spared for the big line, the requirements of the line are small in comparison with the steel-making capacity of the nation. Cost of operating the East Texas-East Coast line has been estimated as lower than that of present tanker-transportation costs. However, tanker costs have been pegged at January 20, 1942, levels by government absorption of crew bonuses and higher insurance rates.

Some time will be required for completing financing arrangements because of certain changes made recently in the plans for the line. Contracts will be approved by the chief engineer of Reconstruction Finance Corp., according to a statement by Jesse H. Jones.

Preliminary discussions have been carried on with steel and contracting companies. Construction should be under way within a few weeks. The work will be divided into several sections in order that it may proceed as fast as possible.

In his letter giving the word to go ahead Jesse H. Jones said:

"It is understood that the industry will supply the necessary personnel, which will be satisfactory to us, to construct and operate the line. It is understood that the engineering plans and surveys heretofore made by the oil industry will be furnished to the enterprise without cost."

Alternatives Were Considered Before Selecting 24-In. Pipe

The final decision to use 24-in. pipe of ⅜-in. wall thickness for the Longview, Tex.-Salem, Ill., line was reached after considering a number of alternatives which were proposed. Some of the alternatives called for materials such as wood and concrete which are not used in petroleum pipe-line services. One proposal which was insistently brought to the attention of officials was that thin-wall pipe be wrapped with wire, although numerous disadvantages seemed to be apparent.

The capacity of the 24-in. Longview-Salem line is mentioned as being 300,000 bbl. and possibly 350,000 bbl. daily, which is four to five times the capacity of a 12-in. line and two to three times the capacity of a 16-in. line.

When plans were made for the National Defense line last year a wall thickness of $\frac{7}{16}$-in. was considered for the 24-in. pipe of the proposed project. Later some thought was given to building a line with wall thickness tapering to a thinner wall at the low-pressure end of sections between pump stations. But it was found that the pipe could be made faster if it were all of uniform thickness. At the same time a decision was reached to use a ⅜-in. wall instead of $\frac{7}{16}$-in., thus making a substantial reduction in the amount of steel required.

Pipe-Line Construction Firms Ready to Handle Large Pipe

With the letting of the contract for 24-in. for the Longview, Tex.-Salem, Ill. pipe line there has been some speculation regarding the rate at which it will be laid. Schedules call for deliveries of 140 miles in July, 170 miles in August, 130 miles in September and 110 miles in October which would be sufficient to keep five gangs working steadily.

In the laying of 26-in. pipe last year for the program of Natural Gas Pipeline Co. of America calling for approximately 400 miles of loops, there were periods when operations were carried on for long stretches at the rate of a mile a day and better. At times work was stopped by delays due to inability to get pipe. In the construction of these 26-in. loops, the company successfully demonstrated the advantages of prefabricated or "factory" bends for large-diameter pipe. Crews were organized to install these bends rapidly and efficiently.

While the natural-gas industry has laid a large amount of 24-in. and 26-in. pipe, the petroleum industry has not used large diameter pipe to any extent for crude and gasoline lines. The largest size commonly used for crude lines is 12-in. Three years ago 100 miles of 16-in. was laid in Venezuela. Last year a few miles of 18-in. was laid at the end of a crude trunk line delivering to the Whiting, Ind., area.

Proposed Big Line Will Connect Important Pipe-Line Areas

Major trunk-line systems with large capacity in the North and the South will be joined by the proposed Longview, Tex.-Salem, Ill., line.

From the East Texas area in the vicinity of Longview, trunk lines which have been delivering to the Gulf Coast include those of Texas-Empire, Humble, Pan American, Atlantic, Texas, American Liberty, Pure, Gulf, and Shell. With the decline of East Texas these systems as a whole are operating considerably below capacity. Taken together their total capacity has been estimated as a good deal more than half a million barrels daily. Through these lines as well as through lines extending westward into Texas, a terminal at Longview could be connected with the great network of pipe lines extending throughout the State of Texas. In addition there are trunk lines in the area drawing on Louisiana production.

The northern terminus of the big line at Salem could be connected with the trunk lines shipping eastward including those of Socony-Vacuum, Sohio, Illinois, and Gulf which have a total capacity for delivering into western Ohio at a rate close to a quarter of a million barrels. In addition there is the Texas-Empire system with a capacity of nearly 100,000 bbl. A misleading impression of the advantages of connections with these northern trunk lines may easily be gotten if it is not realized that these lines are now operating at full capacity in moving oil eastward. It is clear that the country will not derive full benefit from the construction of the big line unless it is extended to the East Coast.

Pipe Is Shipped to Fort Norman for Northwestern Canadian Line

Shipments of pipe are going northward from Alberta to Fort Norman, Mackenzie district, in the Arctic Circle area of northwestern Canada. In these shipments there is sufficient pipe for 700 to 800 miles of line from the Norman Wells field, Fort Norman, to the site of a proposed refinery at White Horse, Yukon. Plans for the refinery are now under consideration.

The line is to be built of 4½-in., 10.79-lb. pipe for operating at 1,800 lb. pressure. Along with the pipe for the line, casing is being shipped for equipping oil wells. Four new rotary-drilling rigs with their crews have arrived in the field.

Shipments of pipe and other supplies are moving by rail from Edmonton to Waterways where they are transshipped to river scows and barges for the river voyage to Fort Norman.

Construction equipment and crews are being moved to the Fort Norman area and plans call for starting work as soon as possible this month. General direction of these operations is being handled from Edmonton, Alta.

Pipe Line Personalities . . . . . O. Q. Lomax

O. Q. LOMAX, newly elected vice president and general manager of Humble Pipe Line Co., Houston, Tex., was born in Chambersburg, Ind., on November 1, 1893. He received his early education in the schools of that community and after graduatiig from high school, he studied mechanical engineering at University of Kansas.

Mr. Lomax has been associated with Humble Pipe Line Co. for more than 16 years. However, he was originally employed by Humble Oil & Refining Co. when he started work with that organization in December 1918. The following year he was transferred to Humble Pipe Line Co. as engineer-draftsman; on November 1, 1919, he resigned. For the next few years, Mr. Lomax was associated with several companies, including the old Simms Oil Co., Texas Co. and Sinclair Pipe Line Co.

In May 1924, he returned to the engineering department of Humble Pipe Line Co., and since then he has successively held positions such as chief draftsman, assistant mechanical engineer, chief mechanical engineer, and division superintendent of the southern division. He was appointed assistant general superintendent of the company in 1937 and he held that position until he was recently elected to the position of vice president. He succeeds Mr. J. A. Neath who resigned several weeks ago to become director of Humble Oil & Refining Co. Mr. Lomax is married and has an 11-year-old daughter, Joanne. He and his family reside in Houston.

Texas Pipe Line Co. Digs Up Pipe for Trunk-Line Loops

Work is now being carried on for taking up pipe in Texas from the Texas Pipe Line Co. This pipe will be available for the program calling for 118 miles of loops on the company's trunk line between Dallas, Tex., and Stuart, Okla. As soon as the government permit is issued authorizing the new construction, it is expected that steps will be taken to start laying the loops as soon as possible.

Magnolia Changes Operation Of Southwest Texas System

In order to relieve the storage shortage in the Corpus Christi area, Magnolia Pipe Line Co. has made certain adjustments in its pipe-line system in Southwest Texas. On June 4 the company began pumping Seeligson crude from its terminal at Corpus Christi to the Tilden station, thence to Beaumont, Tex. The pumps on the Tilden-Corpus Christi system were reversed. In the past this crude was run to Corpus Christi, where it was picked up by tankers and transported to the Beaumont refinery. All of Magnolia's Mirando crude is run from its Government Wells station, in Duval County, Texas, to Tilden station and from there to Beaumont. The Tilden-to-Corpus Christi line was used to supply the Amsco Refining Co. with Mirando crude and also to transport Texas Co. Mirando crude from Government Wells to Corpus Christi. Under the new arrangement, Texas Co.'s crude, which amounts to 40,000 bbl. per month, is being run to Beaumont and from there to the company's refinery at Port Arthur, Tex.

Texas Empire Has Permit For Kansas Pump Stations

Texas Empire Pipe Line Co. has been granted a permit authorizing work needed for the construction of three electric centrifugal pump stations in Kansas located near Eureka, Hiattville, and Humboldt, which will increase the capacity of the company's outlet from western Kansas between Valley Center, Kans., and Sheldon, Mo. Additional equipment for this program called for by changes in the company's plans will require an additional permit. Temporarily the Texas Empire system is utilizing some of the pumping facilities of Sinclair Refining Co.'s Humboldt trunk-line station.

The installation of two 900-hp. diesel engines at Centralia, Mo., has been authorized by an L-41 permit from ODT. This equipment has been made available to Texas Empire and, contrary to a previous report, the program calls for a transfer of this equipment from Centralia, Ill., to Centralia, in Boone County, Missouri. Work is proceeding for the construction of 32 miles of loops on the Texas Empire trunk line between Heyworth and Wilmington, Ill., to increase capacity by 15 per cent. Increased facilities on the southern end of the Texas Empire trunk line will make it possible to move 90,000 bbl. instead of 60,000 bbl. daily. In recent years changes in the system have reduced the amount of Mid-Continent oil handled in the system.

Wartime Truck Laws May Have Lasting Effect

Permanent liberalization of state laws governing the operations of trucks and buses is seen as one of the postwar effects of the interstate agreement on commercial vehicles announced by Jesse Jones, secretary of commerce, a few days ago.

Under the agreement, to which the governors of all 48 states have subscribed, any state laws governing the sizes, weights, and operations of commercial vehicles will be waived for the duration of the war, unless they are at least as liberal as the uniform minimum standard agreed upon through the Council of State Governments. Trucks also will be permitted to go from one state to another without payment of additional fees, taxes, or other charges.

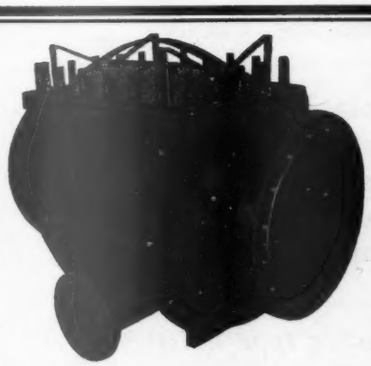
The manner in which ODT truck regulations affect Mid-Continent oil-country operations is the concern of two groups. One of these consists of the managers employed to represent ODT in different sections of the country. The other includes representatives of traffic groups who receive no compensation or reimbursement for expenses from the Government. Among these is W. H. Esser, Shell Oil Co., Inc., who is the chairman representing private carriers on the advisory committee of ODT in Oklahoma. A similar position is held in Texas by Oscar Lynch, Humble Oil & Refining Co.

J. L. Burke, Stanolind Pipe Line Co., is chairman of Shippers Oil Field Traffic Association.

Pipe Mills Are Engaged In War Production

Mills which have been making pipe for the pipe-line industry are now occupied with war production. Casings for projectiles and aerial bombs are turned out by using pipe-manufacturing equipment. A great deal of 10-in. pipe is being used in the making of aerial bombs.

In recognition of the important part which pipe mills have in the war effort, government authorities arranged to have Capt. Hewett T. Wheless, U. S. Army pilot-hero from the Far East, autograph the millionth bomb made at a plant of National Tube Co. in the Pittsburgh, Pa., area. After observing the care required for bomb production he said, "We'll have to make sure that they hit something."



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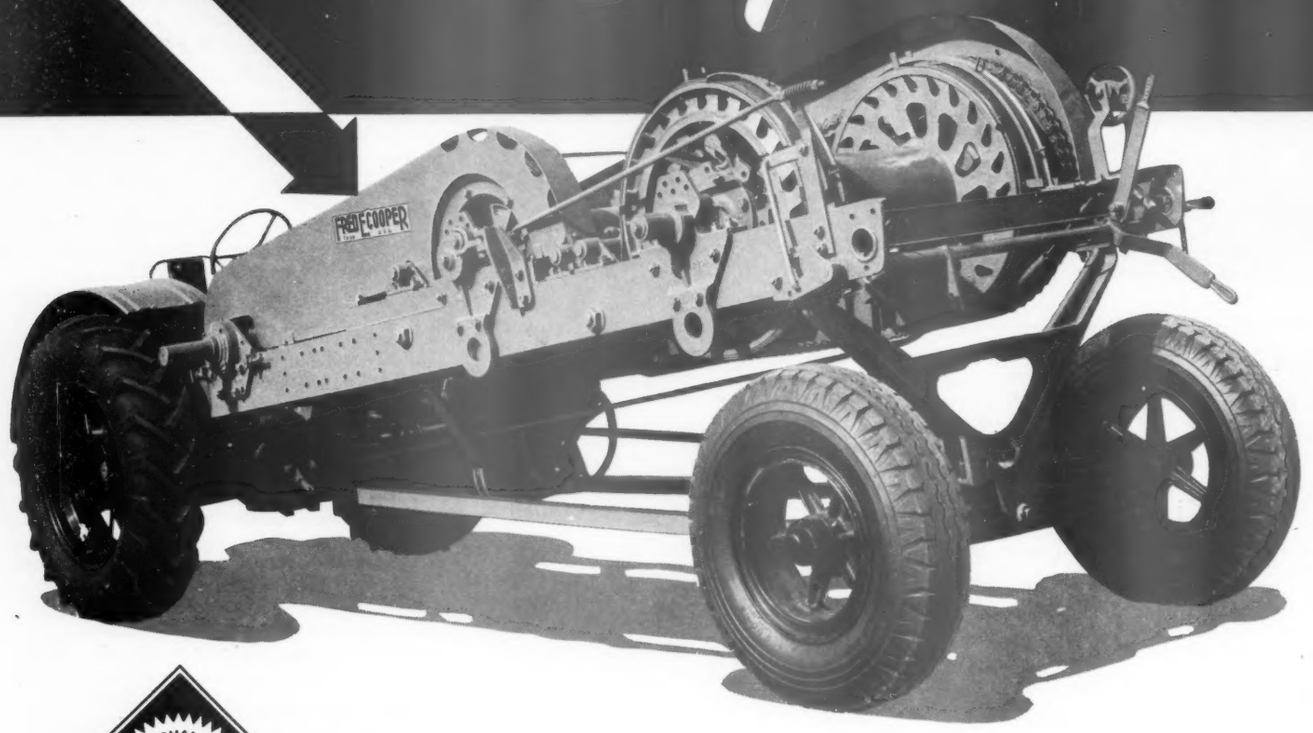

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FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

Two recent developments which may have a far-reaching effect on future prospecting are the discovery of oil in the Paluxy within the East Texas basin and in the Tuscaloosa on the Tensas-Concordia parish line in Central Louisiana.

Both of these finds have definitely increased the depth to which wildcatters must go if they wish for a thorough test. The Paluxy has been a good producing horizon in Talco and Sulphur Bluff but these fields were in the Mexia fault-zone area and there was a general feeling that this production would not extend farther into the basin. Paluxy production on the flanks of the Sabine uplift was gas-distillate and of little importance so far as the basin itself was concerned. Finding Paluxy oil in the basin will cause the deeper drilling of many structures particularly since Amerada's discovery is showing up as a much better well than those which opened Talco and Sulphur Bluff.

The Louisiana discovery marks a continuation of the trend of development along the Gulf Coast. For several years the Wilcox was not considered of much value because producing wells in the upper or Carrizo member were not large. Eola and Ville Platte revived activity in the upper part of the Wilcox section and operators who were not discouraged at finding the upper section dry but went still deeper opened up important production. It was only a question of time before somebody would go completely through the Wilcox and beyond in the search for deeper production. Discovery of oil in the Tuscaloosa at Tinsley made this formation a likely producer in neighboring parts of Louisiana. Now that expectations have been translated into realization this formation will undoubtedly be traced to the southwest and around the Sabine uplift where its relations with the Woodbine will be definitely determined.

It is only a question of time before Cretaceous formations are tested throughout the wide relatively nonproductive sector between the Wilcox trend and the North Louisiana, East Texas and fault-line areas. The current discovery has given additional incentive for speeding up the campaign.

History is repeating itself in West Texas where scattered drilling is welding a number of small producing areas into a single field of the proportions of Goldsmith, Wasson and Slaughter. The Andrews County development started as a northwestern extension of the Goldsmith trend in Ector County and recent reports indicate that another major field is in the making.

Drilling activity remains at nearly a constant level with 317 completions reported compared with 316 for the preceding week. Oil wells were up one, dry holes up two and gas wells down two.

LOUISIANA GULF COAST: Discovery of gas distillate in the Tuscaloosa in the updip Wilcox trend and on the Concordia-Tensas Parish line is reported (p. 69).

CALIFORNIA: The recent record of disappointing discoveries continues. The second well at Antelope Plains missed the pay and was completed as a small gasser in a shallower sand. An outpost to the Delano gas field also missed the pays. The Ramona test which was formerly considered a discovery showed nothing on test and is being drilled ahead. (p. 72).

WEST TEXAS: In the Wentz pool, Pecos County, the Hickory (Cambrian) sand has proved productive although the discovery well is drilling ahead in schist before being completed in the pay. The Ellenburger showing in Sutton County proved to be noncommercial and sulfur water broke into the well on test. As a result of enforced drilling of scattered leases in Andrews County there are indications that another large field will be outlined in this sector (p. 70).

SOUTHWEST TEXAS: Wilson County's Wilcox discovery has been completed as a small pumper. Although it may not lead to the development of important production this well will stimulate prospecting for Wilcox oil over a considerable area. Showings are reported from wildcats in Dimmit, La Salle and Lee counties. A new shallow sand has been opened by a Seeligson extension well (p. 75).

TEXAS GULF COAST: Cockfield production has been found in a wildcat 2½ miles southwest of West Silsbee. Wilcox production is a definite possibility east of the Lake Creek field. Mercy has been extended 1 mile north making it a major discovery and Fayette County's first discovery in the Cistern area made gas with a spray of fresh water (p. 69).

COLORADO: The Little Poose Creek structure known since the days when the Dakota was believed to be the lowest pay horizon in this area is finally to get a test (p. 80).

EAST TEXAS: Amerada's Paluxy sand discovery in Wood County flowed at the rate of 1,920 bbl. (p. 79).

MONTANA: Plans for unitizing a portion of the Bowdoin gas field have been approved by the Department of the Interior (p. 80).

NORTH TEXAS: The Mississippi lime trend in Young County has been widened as a result of Shell's discovery 7 miles southwest of Burns-Larimore. (p. 74).

ALBERTA: A long narrow strip of producing territory may be added to the east side of Turner Valley if Major Oils' test there lives up to present indications. Development of the Fort Norman and Peace Creek areas is taking on more tangible form with preparations under way for drilling in both areas (p. 85).

ILLINOIS: The McClosky lime discovery east of Boyleston is showing better results on deepening. Wildcats in Washington and Clinton counties are finding encouraging shows and may revive drilling in the western part of the basin (p. 78).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended June 13, 1942)

	Oil	Gas	Dry	Total	Footage	Ttl. comp. to date 1942	Ttl. comp. to date 1941
N. Y., Pa., and W. Va.	41	14	4	59	108,560	1,676	2,515
Ohio	4	12	11	27	61,170	449	692
Indiana	1	0	6	7	9,048	167	207
Kentucky	0	2	1	3	5,835	161	302
Illinois	13	0	17	30	87,639	742	1,467
Michigan	11	2	3	16	47,179	318	385
Kansas	16	3	15	34	113,358	691	839
Nebraska	0	0	0	0	0	19	40
Missouri, Iowa	0	0	0	0	0	9	9
Oklahoma	12	0	12	24	83,871	605	679
Texas:							
North Central Texas	6	0	5	11	38,757	589	1,303
West Texas	21	0	5	26	113,699	771	911
Texas Panhandle	1	2	0	3	8,988	209	234
East Texas	3	0	2	5	28,613	195	525
Texas Gulf Coast	4	1	3	8	44,339	392	487
Southwest Texas	12	0	5	17	76,797	623	806
Total Texas	47	3	20	70	311,193	2,779	4,266
North Louisiana	9	0	1	10	57,891	232	269
Louisiana Gulf Coast	4	1	2	7	59,231	266	391
Total Louisiana	13	1	3	17	117,122	498	660
Arkansas	3	0	1	4	24,395	70	76
Mississippi and Southeast	0	0	1	1	7,200	41	116
Montana	4	1	0	5	11,384	75	112
Wyoming	0	0	0	0	0	42	63
Colorado, Utah	0	0	0	0	0	4	18
New Mexico	1	0	1	2	6,839	138	224
California	8	1	9	18	65,378	363	468
Total United States	174	39	104	317	1,060,171	8,847	13,135
Total previous week	173	41	102	316			
Week ended June 14, 1941	446	67	148	661			

Kansas Wildcat Campaign Keeps Near Proven Areas

ENCOURAGED by rising per-well allowables, greater market outlet and higher market demand, wildcatters in the Kansas oil fields were successful in discovering 15 new producing areas and new oil horizons in oil fields during the first 6 months of 1942.

However, the Kansas oil explorer was able to discover only one pool farther than 3 miles from existing proven areas, although many test wells were drilled without success in remote exploration areas. The remaining discoveries comprise four within 1 mile of present producing fields, six within 2 miles of present oil pools and four drilled within a radius of 3 miles from the nearest oil pool.

This did not mean that the search for new fields remote from present areas was not widespread. A concerted effort to seek new discoveries on the northwestern extension of the Central Kansas uplift in Norton, Decatur, Phillips and Graham counties proved a dismal failure with no new fields uncovered on that trend northwest of the prolific Ray pool of Phillips County. This drilling play followed preliminary exploration with core drill and reflection seismograph methods.

Wildcatting Retarded

Highlights of the statistical record of Kansas wildcatting during the first half of 1942 reveal a slump of approximately 50 per cent in the number of wildcat tests drilled, a doubling in the percentage of dry holes to all completions indicating the increased hazard of exploration, and confinement of most exploration wells to the Central Kansas uplift proper. New areas found outside of the Central Kansas uplift proper include one gas discovery in Barber County, two new oil zones in old pools in that county and one new Burbank sand pool in Cowley County and a Mississippian find in Marion County.

A statistical analysis of Kansas pool discoveries by counties for first 6 months of 1942 follows:

County—	No. pools
Barber	3
Barton	2
Cowley	2
Ellsworth	1
Marion	1
Rice	1
Reno	3
Rooks	2
Total for period	15

Eight different producing formations comprised the discovery pays for the 15 new Kansas discoveries during the first 6 months of 1942. These are tabulated as follows in geologic order:

Formations age and character—	No. pools
Pennsylvanian, Elgin sandstone	1
Pennsylvanian, Burbank sand	1
Pennsylvanian, Lansing-Kansas City	3
Mississippian, chat	2
Ordovician, Viola limestone	3
Ordovician, Simpson formation	1
Cambro-Ordovician, Arbuckle	2
Cambrian, basal sand or Reagan	2
Total number of discoveries	15

Federal spacing order M-68, retroactive to December 23, 1941, seriously retarded the volume of wildcat tests drilled during the first 3 months of 1942 in the Kansas fields. However, with the advent of favorable weather conditions, drilling rose rapidly from April 1; weekly first reports of 33 locations included a high percentage of wildcat wells during the second quarter of 1942 in western Kansas. Present indications point toward a continuation of this trend throughout the third quarter.

Barber County Discovery

The most significant remote wildcat discovery 5 or more miles from present development was uncovered during March, 12 miles west of Medicine Lodge in western Barber County, where a deep gas discovery well was completed from the Ordovician Viola lime. It is Champlin Refining Co. 1 C. W. Hildebrand, E½ NE NW 26-32-15w, which logged oil saturation in the base of the Lansing series, the top of the Mississippian, the Viola and the Simpson dolomite. Nearest producing area is the Skinner (Viola lime) pool, 8 miles to the northeast. At midyear no offsets had been drilled although one semiwildcat well was drilling 3½ miles northeast of the gas discovery on a regional structural terrace.

Most significant series of discoveries for the year in the proven areas were the Schweizer and Peace Creek Southwest pool finds on the Peace Creek trend, both productive from the Viola lime. These bring to five the total number of Viola lime producing areas in western Reno County comprising a nest of isolated developments which are fast merging into one single stratigraphic oil accumulation lying on the southeast flank of the Central Kansas uplift and tracing its periphery for a distance of more than 10 miles. This area is fast becoming a market factor in the western Kansas fields with an extremely high percentage of flowing oil wells.

Peace Creek Trend

The Schweizer pool discovery is that of George W. Hinkle and N. Appleman & Co. 1 A. D. Schweizer, SE SE NW 31-22s-9w, completed during February for an initial potential of 774 bbl. daily from a depth of 3,725 ft. At midyear, seven oil wells had been completed in this sector proving for production 400 acres. This pool marks the most northeasterly of the five producing localities on the Peace Creek trend; at the southwestern extremity of the area the Peace Creek Southwest discovery was brought in during June. It is Simpson Oil Co. et al 1-B Souder, SW NE NE 32-23-10w, which drew an initial potential of 1,102 bbl. daily from a total depth of 3,740 ft. in the Viola limestone. The intervening area has been the most active drilling scene in western Kansas during 1942 with only two dry holes to mar an almost perfect oil-well-completion record.

Smyres Development Consistent

Another consistent pool development following a 1942 discovery is that in the Smyres field of eastern Rice County on the east flank of the Central Kansas uplift. This pool, productive from the Mississippian chat, was discovered 2 miles northwest of the Bornholdt pool of Rice and McPherson counties which is also producing from the Mississippian. The Smyres discovery was recorded during February by Nelson Drilling Co. 1 Smyres, NE NE SW 36-19-6w, completed for a maximum 3,000-bbl. well at a total depth of 3,354½ ft. in the chat. At midyear, seven oil wells had been completed over a proven area 440 acres occupying a north-south trend.

Dayton Pool Development

Development of the new Dayton (Lansing-Kansas City) pool of Phillips County, a 1941 discovery, continued during the first 6 months of 1942 and at midyear a total of eight oil wells were completed in this zone.

Ray Pool Development

Drilling development continued at a steady pace in the Ray pool of southwestern Phillips County. During June the field was extended westward into Norton County in the Reagan or basal Cambrian sand. More than 480 acres was proven productive in a north and northwestern extension of the Reagan sand producing area comprising a sand lens lying on the northeast

NEW OIL FIELDS—STATE OF KANSAS—FIRST SIX MONTHS OF 1942

Source of Data: Official Potential Record, Kansas Corporation Commission, Oil Conservation Division, Wichita, Kans.

Pool—	County—	Company and farm name	Description	Date of completion	Prod. formation— Name	Prod. formation— Depth	Initial production	No. of wells June 15
Helken, N.	Ellsworth	N. Appleman & Co. 1 Stratmann	N½ NW NW 24-17s-10w	Feb. 21	Arbuckle	3,229	231 bbl.	2
Lost Springs, E.	Marion	Veeder Supply 1 Williams	N½ NW SW 35-17s-4e	Feb. 14	Mississippian	2,381	45 bbl.	1
Smyres	Rice	Nelson Drlg. Co. 1 Smyres	NE NE SW 36-19s-6w	Feb. 12	Mississippian	3,354½	3,000 bbl.	6
Morton	Reno	Cities Service 1 Morton	SWC NE 17-24s-8w	Feb. 9	Lansing	3,543	185 bbl.	1
Deerhead	Barber	Champlin Ref. 1 Hildebrand	E½ NE SW 26-32-15w	Mar. 26	Viola	4,925	14 M.c.f. daily	1
Peace Creek, S.W.	Reno	Simpson Oil "B"-1 Souder	SW NE NE 32-23s-10w	June 1	Viola	3,740	1,102 bbl.	1
Baum	Rooks	Palmer Oil 1 Baum	S½ SW NE 10-10-16w	Mar. 19	Lansing	3,218	65 bbl.	1
Lake City Spn	Barber	Pryor & Lockhart "C"-2 J. L. Gant	N½ N½ NE 18-31s-13w	Feb. 12	Simpson	4,530-42	343 bbl. 47.6 grav.	1
Whelan-Penn	Barber	Great Lake 1 Swartz	NW SE 31-31-11w	June 11	Penn.		4 M.c.f. daily	1
Deichmann	Cowley	Trees Oil Co. 1 Deichman	NW SW 24-31s-4e	Jan. 6	Burbank	2,841	795 bbl.	1
Henderson	Cowley	Earl F. Wakefield 1 Henderson	N½ NW NW 26-32-3e	Apr. 14	Lansing	2,704	24 bbl.	1
Breford, S.W.	Barton	Auto Ordnance "A"-1 Disque	NE NE NE 23-17s-11w	Apr. 25	Arbuckle	3,333	307 bbl.	2
Schweizer	Reno	Geo. W. Hinkle 1 A. D. Schweizer	SE SE NW 31-22s-9w	Feb 5	Viola	3,725	774 bbl.	6
Merten	Barton	Helmerich & Payne 1 Ida Merten	NW NW NE 10-19-15w	June 4	Reagan	3,580	168 bbl.	1
Ray, E.	Rooks	Derby Oil 1 Steele	N½ NW NW 9-6s-20w	Jan. 24	Reagan	3,639	183 bbl.	1

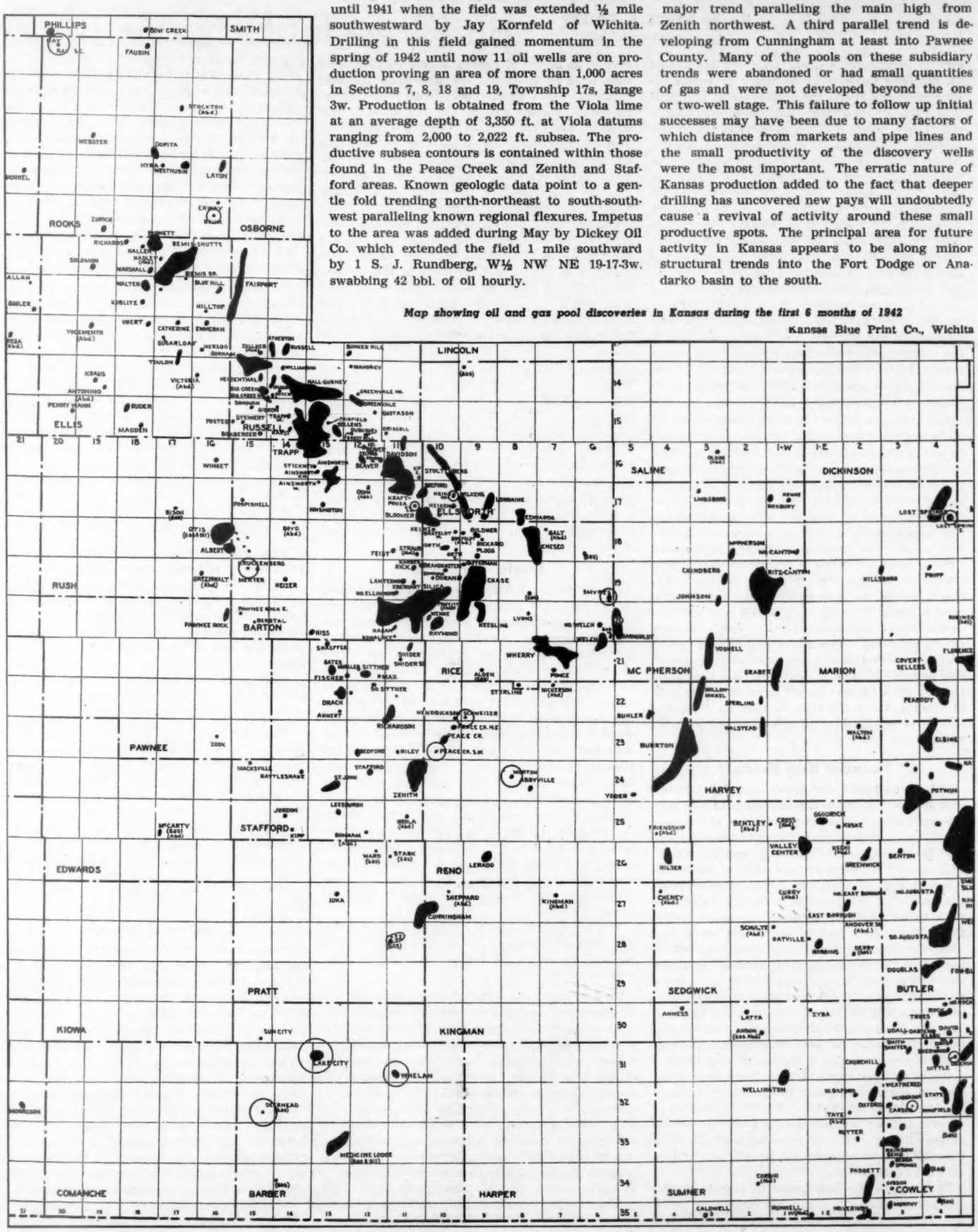
flank of a local pre-Cambrian buried prominence. Meanwhile, additional exploration on the south side of this field served to limit the producing areas as outposts missed the sand and logged the nonproductive pre-Cambrian granite. At mid-year, 40 oil wells were on production with a monthly pipe-line output of more than 40,000 bbl.

Extend Lindsborg Pool

The first half of the current year saw steady development of the new Lindsborg pool west of the town of Lindsborg in northern McPherson County. Discovered in January of 1938 by Carter Oil Co. after extensive geophysical and geological exploration, development remained dormant until 1941 when the field was extended ½ mile southwestward by Jay Kornfeld of Wichita. Drilling in this field gained momentum in the spring of 1942 until now 11 oil wells are on production proving an area of more than 1,000 acres in Sections 7, 8, 18 and 19, Township 17s, Range 3w. Production is obtained from the Viola lime at an average depth of 3,350 ft. at Viola datums ranging from 2,000 to 2,022 ft. subsea. The productive subsea contours is contained within those found in the Peace Creek and Zenith and Stafford areas. Known geologic data point to a gentle fold trending north-northeast to south-southwest paralleling known regional flexures. Impetus to the area was added during May by Dickey Oil Co. which extended the field 1 mile southward by 1 S. J. Rundberg, W½ NW NE 19-17-3w, swabbing 42 bbl. of oil hourly.

Trend Lines

The delineation of geological trends may, if carried too far, resemble the "creekology" of older days. However, existing trend lines in Kansas which are based on structural features show up plainly. These are a series on NE-SW lines south of the Central Kansas uplift and a major trend paralleling the main high from Zenith northwest. A third parallel trend is developing from Cunningham at least into Pawnee County. Many of the pools on these subsidiary trends were abandoned or had small quantities of gas and were not developed beyond the one or two-well stage. This failure to follow up initial successes may have been due to many factors of which distance from markets and pipe lines and the small productivity of the discovery wells were the most important. The erratic nature of Kansas production added to the fact that deeper drilling has uncovered new pays will undoubtedly cause a revival of activity around these small productive spots. The principal area for future activity in Kansas appears to be along minor structural trends into the Fort Dodge or Anadarko basin to the south.



Map showing oil and gas pool discoveries in Kansas during the first 6 months of 1942

Kansas Blue Print Co., Wichita

Pennsylvania-Crude District Needs Further Development

By PARKE A. DICKEY
Pleasantville, Pa.

THE Pennsylvania Grade oil fields are almost the only fields in the country in which development operations are proceeding at a normal pace. The circumstances have combined to place the eastern producers in a particularly favorable position. Their location in the center of the districts of greatest consumption diminishes the transportation problems which are besetting the rest of the industry. Still more important is the fact that 22 per cent of Pennsylvania Grade crude oil consists of a lubricating fraction from which high viscosity index oils may easily be refined. It may be difficult to supply the demands of the United Nations for aviation grade lubricating oil, and in addition, accelerated industrial activity has increased the normal demand from industrial consumers. These demands will more than offset any decrease in the automotive market occasioned by the shortage of gasoline and rubber. They are so urgent, in fact, that a substantial and immediate increase in oil production from this region is essential to the prosecution of the war.

The Office of Petroleum Coordinator is aware of these circumstances, and has shown itself concerned with the necessity for increasing crude production from the eastern region. During the winter of 1941-42 it repeatedly urged on the Office of Price Administration that the price of crude oil be increased to stimulate development work. The greater part of any increase in production will come from secondary-recovery operations. Not only does the Office of Petroleum Coordinator impose no well-spacing restriction on this work, but it has shown a disposition to allocate sufficient material for properly planned new developments. Where secondary-recovery operations are not in use, that office has recommended to the War Production Board in numerous instances, that material be used to drill wells less than 1,000 ft. deep on a spacing of not more than one well to 5 acres, for wells 1,000 to 2,500 ft. deep, one well to 10 acres, and over 2,500 ft. deep, one well to 20 acres.

Financial Help Needed

It is to be hoped that some western operators who are now having to curtail their activities may interest themselves in the possibilities of the eastern fields. A larger supply of crude from this district is urgently needed, and it is doubtful whether it can be obtained in time without some outside assistance. During the last 10 years the eastern producing industry has been in a rather depressed condition, due partly to a series of violent price fluctuations, and partly to the social and economic conditions within the industry which have kept the operating units too small and prevented the more general application of modern technology. For the war period it is probable that there will be little or no variation in price. There will probably always be a considerable differential above the price of western crudes because of the proximity to centers of consumption, and especially because of the large lubricating fraction the Pennsylvania Grade crudes contain. An increase in production effected by the more general use of modern methods should reduce average lifting costs very materially and place the industry on a sound economic basis which will insure a long future.

In the past, the investment of outside capital has proved of questionable benefit to the industry. In far too many cases money has been expended on behalf of gullible clients by promoters with little or no technical competence. The purchase of leases should be preceded by careful geological studies and by the coring of a few wells. There are enough successful secondary projects in operation in all parts of the field, and enough information on the early history of the properties is available to enable a competent geologist to judge with a good deal of assurance whether the properties are rich enough to repay the investment. Unfortunately the depressed condition of the industry during the past 10 years has resulted in the emigration of many of the best qualified geologists and engineers to the western fields. The western producing companies, however, realize the necessity for sound advice and have available trained and experienced staffs who can choose the properties well and develop them wisely.

Although much of the well equipment may be obtained second hand from unprofitable leases, some difficulty may be encountered in obtaining the necessary new machinery, especially compressors. Some second-hand compressors are still available, and it is to be hoped that the War Production Board may facilitate the allocation of new material where it is required. In some sections available man power has drifted to war industries, and wages higher than those customary in the past will be necessary to obtain experienced men.

District Conditions

Conditions are widely different in different districts in western Pennsylvania, but in all of them rich spots offer favorable prospects for secondary-recovery developments. Development costs range up to $5,000 or more per acre at Bradford, where water flooding is practiced, and where recoveries in excess of 5,000 bbl. per acre are frequently obtained. Probably $1,000 to $1,500 will be the average development cost per acre in the Venango district, where recoveries on some leases will exceed 3,000 bbl. per acre. Farther south, less intensive secondary-recovery methods are used. Good recoveries have been obtained with very small expenditures, and these may be greatly increased by more new drilling and more intensive repressuring. Lifting costs depend entirely on the daily oil production per well, and range greatly, from less than $1 per barrel on intensively operated properties to $3 per barrel or more on properties that have reached the economic limit by primary methods.

The Pennsylvania Grade region is divided by the crude-oil purchasers into five districts. The geology and operating technique is different in each of them.

Bradford-Allegany.—The district comprises the Bradford pool and several outlying pools in New York State. Wells range from 1,000 to 1,800 ft. in depth. Secondary recovery by artificial and intensive water flooding has proved particularly effective, and about half of the production of the region comes from this district. Average recoveries per acre range from 3,000 bbl. in the Allegany pools to over 5,000 bbl. in parts of the Bradford pool. It has been estimated that about 100,000,000 bbl. of oil remain to be recovered by water flooding in New York. The Bradford pool has a continuous area of more than 84,000 acres, and produced over 200,000,000 bbl. of oil by primary methods. About 180,000,000 bbl. have been produced by water flooding to date, and it is estimated that another 120,000,000 bbl. may be economically recovered.

Kane to Butler.—The district includes a large area of Pennsylvania in which there are a very large number of pools of various stratigraphic positions. Water flooding has been successful in the Warren and Kane districts, but in spite of numerous well-planned experiments, it has not been successful elsewhere. Air and gas repressuring has, however, been generally successful, especially in the Titusville-Oil City district where recoveries have been as high as 3,000 bbl. per acre although the average will probably be not much over 1,000 bbl. per acre. Wells range from 500 to 2,500 ft. in depth, with the majority of the pools producing from about 1,000 ft. Drilling costs are low and the average cost of drilling, shooting, and completely equipping a well ranges from $1,000 to $1,500. There are about 350,000 acres of productive territory, and allowing for poor recoveries from marginal properties, it is estimated that 260,000 bbl. of oil may be produced by presently used secondary methods.

Southwest Pennsylvania.—There are about 113,000 acres of productive territory, and the wells range in depth to 3,000 ft. Gas repressuring has been attempted in only a few cases, but it proved remarkably successful in spite of the fact that no new wells were drilled and the old wells were spaced widely and irregularly. It is difficult to estimate with any assurance the quantity of oil recoverable by secondary methods from this district, but it should be in excess of 75,000,000 bbl. Some wells drilled 50 and more years ago still produce several barrels per day by primary methods, and it seems likely that intensive gas repressuring, or possibly in some cases water flooding, will prove successful if the deeper drilling costs can be overcome by modern machinery.

West Virginia.—Conditions here differ widely from pool to pool, and wells range in depth from 1,000 to over 3,000 ft. There are about 420,000 acres of developed oil lands. It is estimated that 230,000,000 bbl. may be recovered by primary and secondary methods from developed acreage now producing, and an additional 214,000,000 bbl. from acreage now undeveloped or abandoned. Gas repressuring is more extensively practiced than in southwestern Pennsylvania, and excellent results have been obtained in many instances.

Southeast Ohio (Buckeye).—Seventeen counties in southeastern Ohio produce oil classified and marketed as Pennsylvania Grade. Wells range in depth from a few hundred to 3,500 ft., and productive pools occur in strata ranging from the Silurian to the Pennsylvanian. There are about 250,000 productive acres, and the estimates of oil recoverable by secondary methods range up to 150,000,000 bbl., although good geological data for estimates are not available. Air and gas repressuring are practiced in many places with notable success.

Future of Industry

Except for the Bradford district, the oil-producing industry in the East is generally in a depressed condition. The frequent and violent fluctuations in price have been discouraging. Nearly all the leases are small and are operated by individuals or families. Money that should have been spent on improvements and development to offset depletion was spent for other purposes. The operators, although for the most part able and experienced oil men, are conservative, and the vast majority lack either the training or the capital to install successfully secondary-recovery methods. The introduction of new capital and technology into the districts should have the effect of stimulating the local operators to place their operations on a sounder economic basis.

Although new oil pools will undoubtedly be

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TEXAS GULF COAST

Cockfield Sand Pool Opened Near West Silsbee Field

By F. L. SINGLETON

HOUSTON, Tex.—A new Cockfield sand discovery in Hardin County, running of casing in a 12,000-ft. wildcat in Montgomery County, and the announcement of several interesting wildcat locations, marked up an interesting week of developments for the Texas Gulf Coast district the past week.

The new pool opener is American Republics and Houston Oil Co. 1 Hampton fee, approximately 2½ miles southwest of the West Silsbee field, Hardin County. Five and one-half inch casing was being cemented for completion following a 40-minute drill-stem test in the Cockfield sand at 6,935-54 ft., the total depth, which tested 112-lb. working pressure and the well flowed pipe-line oil in 20 minutes. After the testing tool was closed, 21 thribbles of oil were recovered. The sand section is believed to be the lower Cockfield in view of showings of oil and gas logged in the upper section at intervals from 6,828-41 ft. However, drill-stem testing of this sand recovered salt water. The producing sand corresponds with that of the West Silsbee field, but the two structures are believed to be separated and the new area will be referred to as the Hampton field. The well is located in the A. Hampton league, which is controlled jointly by the two companies.

Montgomery County Wilcox Sand Discovery Indicated

Montgomery County had promise of a new Wilcox sand discovery as Superior and Atlantic Refining Co. cemented 7-in. casing at 12,430 ft. in 1 E. G. Frost, located in the Deering Creek area, about 5 miles due east of the Lake Creek field. This well was previously reported as logging several promising sands, but details are not available as the well has been drilled "tight.". The depth of the well indicates that any production developed will be similiar to that of the Lake Creek field which is producing gas-distillate from three main sands at intervals from 9,200 ft. to 11,000 ft.

The Mercy field, San Jacinto County was definitely established as the most important discovery to be opened in the district this year as Atlantic 1 I. R. Palmer, about 1 mile north of production flowed at the rate of 35 bbl. of 37.8-gravity oil per hour through a ¼-in. choke while testing through perforated casing opposite the Wilcox sand at 8,282-89 ft. The producing sand was topped slightly lower than the discovery well. This is the fourth producer for the field and the well is expected to be offset by Shell Oil Co., Inc., which controls most of the acreage in the area.

Interest in the updip sector of the Wilcox trend was increased following the completion of Continental 1 Gabitsch, located in the Cistern area, Fayette County. Final completion was made by perforating casing opposite the Wilcox sand at 2,808-14 ft., and the well gaged 671,000 cu. ft. of gas daily with a spray of fresh water through a 7/16-in. choke. Tubing pressure was 840 lb. This well has been in the process of completion for the past several weeks and has shown promise of oil production as drill-stem testing at 2,867-73 ft., recovered several hundred feet of pipe-line oil along with considerable fresh water. This is the first field to be opened in the county and a continuation of development is anticipated.

In line with this shallow play, Phillips Petroleum Co. has released completion data on its 1 Jericho, a gas well, located on the Millican salt dome, Brazos County. Total depth is 3,559 ft., with 7-in. casing cemented at 3,522 ft., and the well flowed an estimated 10,000,000 cu. ft. of gas daily through perforated casing at 3,342-48 ft. The completion of these wells lends encouragement to an expansion of exploration along this particular area and an increase in wildcatting is already under way through Angelina, Houston and Walker counties.

Harmon Field Extended

Gulfboard 2 Harmon, several hundred feet east of the discovery well of the Harmon field (South Ganada), Jackson County, flowed 104 bbl. daily through a ⅛-in. choke from perforated casing opposite the discovery pay at 5,381-89 ft. Additional wildcats were being started in the county, both being located 4 and 5 miles southeast of the town of Ganado. The new operations W. S. Boyle et al 1 Rose & Sample, Block 5, G. Sutherland Survey, and G. I. Warren and Salt Dome 1 G. Zazieck, located in the same survey. In the meantime, J. B. Coffee is moving in material for 1 T. N. Mauritz, as an extension test to the same operators' 1 Mauritz which opened new production in the Mauritz area.

In addition to the wildcats in Jackson County, preparations were being made to start four others in Brazoria, Chambers, Montgomery and Tyler counties. This is the largest number of wildcat operations to be announced for the district in several weeks.

NEW LOCATIONS

Brazoria County: Humble 2 Houston Farms Development Co., 14 mi. southeast of Liverpool, T. W. Lyle Sur.

Montgomery County: Superior 1 Blanche Foley, 3½ miles west of Tamina, H. Dunnman Sur.

Chambers County: Arkansas Fuel 1 Guy C. Jackson, 5 mi. southeast of Double Bayou, J. Whitcomb Sur.

Tyler County: R. E. Fair, Inc., 1 J. M. Sturrock, 5 mi. northeast of Colmesnell, S. L. Graham Sur.

Jordan Drilling Co. 1 I. B. Munson, which showed promise the previous week of opening Wilcox sand production in the Livingston field, Polk County, halted drilling operations at 7,396 ft., and 5½-in. casing was cemented for a production test at 7,240 ft. Drill-stem testing at 7,036-47 ft., recovered 1,600 ft. of pipe-line oil.

TEXAS GULF COAST COMPLETIONS

Wildcats

Fort Bend County: H. C. Cockburn 1 A. E. Quinn, dry, T.D. 8,504 ft.

Walker County: Mrs. Irene Allen 1 J. S. Davidson, dry, T.D. 4,027 ft.

Fields

Cistern, Fayette County: Continental 1 Gabitzsch, 671,000 cu. ft. gas, 7/16-in. choke, perf. casing 2,808-14 ft., T.D. 4,340 ft.

Harmon, Jackson County: Gulfboard 2 Harmon, 104 bbl., ⅛-in. choke, perf. casing 5,381-89 ft., T.D. 5,394 ft.

North La Ward, Jackson County: Magnolia 2-A Four Way ranch, 117 bbl., 7/64-in. choke, perf. casing 5,225-27 ft., T.D. 5,700 ft.

Magnolia 21 Gordon, 104 bbl., 9/64-in. choke, perf. casing 5,208-13 ft., T.D. 5,214 ft.

Stanolind 2 Wolf, dry, T.D. 9,250 ft.

West Columbia, Brazoria County: Smith Salvage 4 Masterson, 40 bbl. pumping, top sand 1,711 ft., T.D. 1,910 ft.

LOUISIANA GULF COAST

Concordia Parish Wildcat May Produce From Tuscaloosa

By F. L. SINGLETON

NEW ORLEANS, La.—Interest in the updip sector of the Wilcox trend in South Central Louisiana was increased the past week by the completion of California 1 Pan American Life Insurance Co., a wildcat located in 16-9n-10e, Concordia Parish, about 10 miles northeast of the town of Ferriday, near the west bank of the Mississippi River. From a geological viewpoint the discovery is of exceptional interest as future exploration in this area as well as Mississippi and Alabama will be affected by deeper exploration.

The discovery well which opens the first production in the parish was drilled to a total depth of 9,997 ft., and was plugged back and completed through perforated casing at 8,935-46 ft. On a production test flowing through a 7/16-in. choke, the well flowed 128 bbl. of water-white distillate and from 3,000,000 to 5,000,000 cu. ft. of gas daily. In addition to the present sand additional shows of oil and gas were reported logged in the Wilcox formation at approximately 4,500 ft. However, the well was drilled extremely tight and geological markers and other details were not available.

The significant feature of the strike is that the producing sand has been tentatively identified as the Tuscaloosa formation of basal Cretaceous age which is said to be equivalent to the Woodbine sand in East Texas. If this is true it is the first of this type production to be found in South Central Louisiana, and emphasizes the importance of deeper exploration along the trend extending into Mississippi and Alabama, which heretofore has been directed largely to the middle Wilcox and the Eutaw and Selma chalk in the Upper Cretaceous. Production possibilities from the Tuscaloosa has been known for some time, but the only commercial production developed was in 1940 when Union Producing Co. 1 Powell in the Tinsley field, Yazoo County, Mississippi, was completed for an excellent producer at 6,110-15 ft. However, the completion of the well failed to result in deeper exploration, and the majority of number of wildcats drilled failed to penetrate the Cretaceous section. As a result many of these prospects can now be reinstated as favorable structure and will no doubt be redrilled in light of this new discovery.

Pine Prairie Test Drilling Deeper

There were few important developments in the southern part of the state. On the southwest

(Continued on Page 79)

Production Found in Hickory Sand in Pecos County

By ROBERT INGRAM

MIDLAND, Tex. — That oil production from rocks of Cambrian age is possible was proved last week in Pecos County. Of two wells drilled into the Hickory sand (Cambrian), one, Gulf Oil Corp. and L. H. Wentz 3 Millar, looked like a commercial well. The other, Skelly Oil Co. 2 Crockett in the Apco-Warner field, found the Hickory dry but made a 1,200-bbl. well from the overlying Ellenburger.

Gulf and Wentz 3 Millar et al, Section 43, Block 11, H.&G.N. Survey, was drilled as an offset to the 2 Millar which opened Ellenburger pay last fall in what was relatively virgin territory. No. 3 Millar, which found the Ellenburger dry at 4,167-4,376 ft., was drilled on to the Hickory sand, topped at 4,376 ft., and swabbed oil from sand at 4,376-92 ft.

First swab test was made at a total depth of 4,388 ft. where 200 bbl. of oil was recovered in 8 hours. Deepened to 4,392 ft., where the base of the Cambrian was called, it was swabbing at the rate of 25 bbl. of oil every 8 hours. The well was drilling ahead in schist and was expected to go to at least 4,402 ft. and then be shot. Seven-inch casing had been set at 4,355 ft.

If it makes a producer, the 3 Millar will be the first Cambrian producer in the Permian basin, and will add that section to the several pays of Permian and Ordovician age now producing there.

Skelly 2 Crockett, Section 5, Block 110, T.C. R.R. Survey, which had dry Hickory sand at 4,710-69 ft., was completed by perforating 5½-in. casing at 4,620-4,705 ft. opposite the Apco-Warner field's Ellenburger pay section. Top of the Ellenburger, from an elevation of 2,463 ft., was 4,230 ft. On potential test, the well flowed 1,201 bbl. of oil daily through ¾-in. tubing choke. Oil tested 42.8 gravity and gas-oil ratio was 1,011:1. It was at the Apco-Warner field that Ordovician production was first opened in West Texas.

Nichols Pool Opened

Jimmie O'Quinn et al 1 C. A. Nichols, 2½ miles southeast of the Shipley pool in southeastern Ward County (see completions), opened a new Permian pool which was promptly named "Nichols." The same operators have staked location for 1 Monroe, 330 ft. from the northeast and southeast lines of S¼ of Section 5, Block 5, a diagonal southwest offset to the discovery.

Water and Oil in Delaware Sand Strike

Some oil and salt water was being recovered at J. E. FitzPatrick and Fred Hyer 1 T. B. Pruitt, Section 23, Block 1, W.&N.W. Survey, northwestern Ward County. There were indications that the well might have been shot in a pocket of water which operators thought would be exhausted. They had set 5½-in. casing at 4,670 ft. Before shooting, the well had swabbed oil from Delaware lime and sand at a rate estimated at 50 bbl. daily. After the shot it filled 1,500 ft. with fluid in 13 hours. Delaware black lime was topped at 4,814 ft. and Delaware sand at 4,847 ft. The well is 4 miles northeast of Shipley 1 Monroe, lone Delaware producer in the Monroe pool.

Efforts were still under way to plug off sulfur water at M. C. Moore (formerly S. B. Roberts et al) 1 G. S. Allison, Section 44, Block K, G.H.&S.A. Survey, on the Edwards Plateau 11 miles southeast of the Page gas field. Drilled to 5,416 ft. in Ellenburger dolomite, the test was plugged back to 5,347 ft., casing was perforated at 5,301-47 ft. and the hole was bailed dry. Casing was then shot at 7-ft. intervals from 5,320 ft. to 5,293 ft. and the well was acidized. It was then swabbed, made a head of oil and died. Sulfur water broke in.

SOUTHERN WEST TEXAS COMPLETIONS

Wildcats

Pecos County: Anderson-Prichard 1 Charlotte Ogilvie, NW NW Sec. 30, Blk. 140, T.&St.L. Sur., 5 mi. SW of Apco-Warner pool, elev. 2,559 ft., dry, show in Yates section 1,130-80 ft., base Permian and top Detrital 5,230 ft., Simpson 5,570 ft., McKee sand 6,370 ft., T.D. 6,652 ft.

Sterling County: S. C. Currie 1 Harris est., NW NW Sec. 129, Blk. 6, H.&T.C. Sur., 14 mi. SE of Sterling City, elev. 2,276 ft., dry, lime 1,047 ft., sulfur water in sand 1,405-7 ft., T.D. 1,407 ft.

Ward County: Magnolia 1-60 George Sealy, SW SW Sec. 60, Blk. F, G.M.M.B&A. Sur., 1 mi. N of Darby pool and W of South Magnolia Sealy pool, elev. 2,647 ft., dry, lost returns at 3,274 ft., T.D. 3,277 ft.

Jimmie O'Quinn 1 C. A. Nichols, 2,310 ft. from NE line and 330 ft. from SE line, Sec. 6, Blk. 5, H.&T.C. Sur., 2½ mi. SE of Shipley area, elev. 2,606 ft., pumped 49 bbl. oil plus 20 per cent water after shot, anhydrite 490 ft., salt 671 ft., Yates sand 1,800 ft., pay 2,400 ft., T.D. 2,449 ft., *opens Nichols pool.*

Fields

Abell, Pecos County: Tal-Vez 1 T. W. Hook, SE SE SE Sec. 25, Blk. 9, H.&T.C. Sur., elev. 2,390 ft., flowed 144 bbl. through ¼-in. tubing choke after acid, Tulip Creek 4,865 ft., McKee 4,934 ft., Ellenburger 5,803 ft., pay 5,800 ft., T.D. 5,867 ft.

Abell Permian, Pecos County: Siemonelt Drilling 1 Jennie Barnhart, 489 ft. from NE line and 330 ft. from NW line Lot 14, Sec. 15, Blk. 2, H.&T.C. Sur., elev. 2,371 ft., flowed 299 bbl. through ½-in. tubing choke natural, pay 2,274 ft., T.D. 2,280 ft.

Byrd, Ward County: Stanolind 1 M. L. Coons, 1,996 ft. from NW line and 660 ft. from SW line Sec. 35, Blk. 34, H.&T.C. Sur., offsets small discovery well, elev. 2,606 ft., dry, sulfur water 3,090-3,200 ft., T.D. 3,200 ft.

Goldsmith, Ector County: Gulf 389 Goldsmith, NE NE Sec. 29, Blk. 44, Twp. 1s, T.&P. Sur., elev. 3,172 ft., flowed 501 bbl. through tubing after shot, pay 4,203 ft., T.D. 4,252 ft., *south edge well.*

Keystone Colby, Winkler County: Richardson & Bess 4 Bashara, NE NW NE Sec. 21, Blk. 77, P.S.L. Sur., elev. 2,975 ft., flowed 563 bbl. through 38/64-in. tubing choke after shot, pay 3,255 ft., T.D. 3,410 ft.

Richardson & Bass 9 Walton, SE NW Sec. 5, Blk. B-2, P.S.L. Sur., elev. 2,968 ft., flowed 306 bbl. through ½-in. tubing choke after shot, pay 3,220 ft., T.D. 3,372 ft.

Taylor-Link, Pecos County: Dave Breeding 2-11 University, SW SE Sec. 11, Blk 18, University Sur., elev. 2,500 ft., pumped 317 bbl. oil plus 20 per cent water, pay 1,608 ft., T.D. 1,615 ft., *northwest edge well.*

Heavy Drilling Program May Link Andrews County Pools

The heavy drilling program under way in southwestern Andrews County (forced by University leases), gave indication last week of proving up with less than a score of wells another huge Permian basin field—this one covering an area 11 miles long and 2 miles wide from the Ector County line in a northwesterly direction. Production in the area, all opened in recent months, has been classed as three or four separate pools with pays from either Permian or Ordovician formations or both.

However, as the drilling campaign took shape, it became apparent that these pools were expected to join into a single field. Five outposts staked last week by Phillips Petroleum Co., which owns most of the acreage, completed a pattern of tests which would virtually blanket the area. Since Phillips has favored naming its most recent discovery in the area the M-Bar pool—same name as that applied to wells straddling the Ector County line—it seemed likely that the West Andrews and two M-Bar pools would be absorbed under that name.

The new locations were for 9 University-Andrews, Section 32, Block 10; 10 University-Andrews, Section 36, Block 11; 11 University-Andrews, Section 25, Block 11; 12 University-Andrews, Section 24, Block 11, and 13 University-Andrews, Section 13, Block 11. All of these wells will test the Ordovician zone, recently opened by Phillips 2 University-Andrews, Section 30, Block 10.

Phillips has six other tests drilling, four of them nearing completion in the Periman and two reaching for the Ellenburger, and Atlantic Refining Co. was stretching southeast from the West Andrews pool with a likely extension at 1-A University, in pay at 4,284 ft., and a drilling well at 1-B University, both in Section 13, Block 11.

Lubbock Test Swabs Fluid

Oil load was being swabbed out after second-stage treatment with 5,000 gal. of acid at Stanolind Oil & Gas Co. 1 Stinnett, Labor 18, Leauge 4, San Augustine C.S.L. Survey, in southeastern Lubbock County. The acid was injected through 2-in. tubing at 4,760 ft. After initial treatment with 1,500 gal., the test had swabbed 35 bbl. of fluid in 24 hours, 28 per cent emulsion and 6 per cent water. It is being tested through perforations in casing at 4,690-4,767 ft.

NORTHERN WEST TEXAS COMPLETIONS

Wildcats

Dickens County: Humble 2 Matador Land, SW SW Sec. 5, Blk. 1, Shock & Arnold Sur., 18 mi. NE of Dickens and 3½ mi. N of 1 Matador dry hole at 7,074 ft., dry, no shows, reported running low, T.D. 6,314 ft.

Fields

Iatan, Howard County: Mid-Continent 4-B Denman, SW NE SW Sec. 16, Twp. 1s, Blk. 30, T.&P. Sur., elev. 2,300 ft., pumped 251 bbl. after shot, pay 2,630 ft., T.D. 2,855 ft.

Slaughter, Cochran County: Continental 3-58 Dean, 651 ft. from N line and 2,009 ft. from E line of lease, Lge. 58, Martin C.S.L. Sur., elev. 2,689 ft., flowed 615 bbl. through tubing after acid, pay 4,920 ft., T.D. 4,969 ft.

Devonian 20-A Duggan, SW SW Lab. 3, Lge 55, Oldham C.S.L. Sur., elev. 3,665 ft., flowed 1,667 bbl. through casing after acid, pay 4,961 ft., T.D. 5,016 ft.

Slaughter, Hockley County: Honolulu 16-A Mallett, SE SE Lab. 10, Lge. 52, Scurry C.S.L. Sur., elev. 3,574 ft., flowed 384 bbl. through casing after acid, pay 4,980 ft., T.D. 5,025 ft.

Honolulu 22-A Mallett, SW SW Lab. 3, Lge. 52, Scurry C.S.L. Sur., elev. 3,584 ft., flowed 964 bbl. after acid, pay 4,960 ft., T.D. 5,028 ft.

Honolulu 36-B Slaughter, SW SW Lab. 52, Lge. 37, Zavalla C.S.L. Sur., elev. 3,523 ft., flowed 985 bbl. through casing after acid, pay 4,910 ft., T.D 4,995 ft.

Humble 4 Coons, SW NW Sec. 11, Blk. X, P.S.L. Sur., elev. 3,515 ft., flowed 1,398 bbl. through 2½-in. casing outlet after acid, pay 4,910 ft., T.D. 5,022 ft., P.B. 5,012 ft.

Western States 4 Coons, NE SE NE Sec. 11, Blk. X, P.S.L. Sur., flowed 1,568 bbl. through casing after acid, pay 4,940 ft., T.D. 5,041 ft.

Western States 13 Mallett, SW SW Lab. 10, Lge. 51, Scurry C.S.L. Sur., elev. 3,591 ft., flowed 837 bbl. oil plus 2 per cent water through casing after acid, pay 5,000 ft., T.D. 5,028 ft.

Slaughter, Terry County: De Kalb Agricultural Association 1 M. E. Jacobson, NE NW SE Sec. 6, Blk. D-11, J. H. Gibson Sur., elev. 3,537 ft., flowed 919 bbl. through casing after acid, anhydrite 2,297 ft., brown lime 3,900 ft., solid lime 4,220 ft., pay 5,022 ft., T.D. 5,055 ft., P.B. 5,048 ft., *south outpost.*

Honolulu 3-4 De Vitt, NE NW NW Sec. 4, Blk. D-11, J. H. Gibson Sur., elev. 3,516 ft., flowed 2,106 bbl. through 2½-in. casing outlet after acid, pay 4,995 ft., T.D. 5,035 ft.

Wasson, Yoakum County: American Liberty 9 Johnson, NW NW Sec. 772, Blk. D, J. H. Gibson Sur., elev. 3,688 ft., flowed 427 bbl. fluid cut 3 per cent water through ⅞-in. tubing choke after acid, pay 4,970 ft., T.D. 5,268 ft.

Drilling & Exploration 1-A W. S. Knight, SE NW Sec. 773, Blk. D, Gibson Sur., flowed 408 bbl. through ¼-in. tubing choke after acid, pay 4,970 ft., T.D. 5,235 ft., *northwest edge of pool.*

Trinity Drilling 3 Shanks, SE SW Sec. 700, Blk. D, J. H. Gibson Sur., elev. 3,632 ft., flowed 409 bbl.

(Continued on Page 83)

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CALIFORNIA FIELD REPORT

Second Antelope Plains Well Misses Sand; Is Small Gasser

By L. P. STOCKMAN

LOS ANGELES, Calif.—Shell Oil Co., Inc., finished its second well in the recently discovered Antelope Plains field of Kern County as a gas producer. The productive area is limited to that part of the structure north and west of this well which failed to find the Williams oil sand productive. Shell finished 67-6 Williams in 6-28s-20e, flowing 400,000 cu. ft. of natural gas daily from a total depth of 3,498 ft. but from an effective plugged depth of 2,190 ft. The company landed a solid string of 5½-in. casing at 2,188 ft. with perforations at 1,846-2,005 ft. and 2,044-2,188 ft. This upper gas zone was cored and tested out for a short period of time in the discovery well but drilling was resumed. The present well is about 70 ft. lower structurally than the discovery well and indicates that fee acreage of Chanslor-Canfield Midway Oil Co. in 7-28s-20e, will be found to be located outside the productive limits of the Antelope Plains field. Chanslor-Canfield's first well on this property, 7-1 fee, found the Williams zone barren and the hole was carried down into the Eocene. Present production in this field is coming from the Temblor of lower Miocene age. It is quite likely that Shell will start another well shortly, probably northwest of the discovery well. The Antelope Plains field produces a heavy crude oil that is in high demand to meet the increasing demand for fuel oil. It is located due west of the southern tip of the North Belridge field where the Temblor is produced from a depth of approximately 5,500 ft. The depth of the two areas indicates an abnormal rise in the intervening 4 miles, especially in view of the fact that the Temblor outcrops about 10 miles to the west of the Temblor Range. The area around the Antelope Plains field. as the name suggests, is a flat gentle rolling plain with little or no evidence of structure. Numerous wildcats have been drilled in this general region in the past but it remained for Shell to get the first commercial production. As a matter of fact Shell has drilled several wildcats in this area and, while some shallow showings were logged in the wildcat drilled on the Voight property by Shell, no production was secured until the company moved onto the Williams lease and drilled its first test. Gas from the current completion, 67-6 Williams, will be used probably for fuel in drilling the next and possibly subsequent wells. To date all drilling has been done with portable drilling equipment and considering the shallow depth at which production is secured this type of light drilling equipment may be employed exclusively at least for the time being.

Two Ten Section Wells Being Completed

The current week's completion list contains a new well in the Ten Section field of Kern County and a second well in that field has been granted an exception in order that the hole may be completed. Shell suspended drilling operations in the Ten Section field when Order M-68 appeared as the two wells being drilled at the time were located prior to the war and were based on a 10-acre spacing program. The necessary exceptions were recently granted and both wells which have been standing suspended since early in December will be completed and future drilling stopped. Both will be completed as slim holes and the casing for both wells had been secured prior to the issuance of M-68. Shell has a number of other locations staked in the Ten Section field and if it is necessary to undertake any additional drilling to meet future demands the company is ready to go ahead. Production in the Ten Section field comes from the Stevens oil sand of Miocene age but the Rio Bravo and Vedder of lower Miocene age and the Wagonwheel zone of Eocene age have not been tested. The Stevens zone at Ten Section is more prolific than the same zone found in other adjacent fields and this may be a good omen with respect to deeper zones. Ten Section, which was discovered by Shell Oil Co., Inc., in 1936 by a combination of geology, geophysics and core-hole drilling in which over 100 core holes were drilled, was the first of the many fields discovered away from the rim of the San Joaquin Basin.

Delano Gas Field Defined

Trico Oil & Gas Co. attempted to extend the productive limits of the Delano gas field of Kern County and failed this week when 1 Lee in 17-24s-23e, did not find any sand bodies present. This well located about 2,500 ft. north of production cored the first Mya gas zone at 2,404 ft. and found the second Mya or B zone at 2,426 ft. Neither zone contained any body of sand. Trico Oil & Gas Co. has now moved east of 1 Lee in the same section and will drill a second well.

In the central part of the state, several new wells are being drilled in search of gas production, and several additional wells have been staked. In the Rio Vista gas field, Texas Co. is rotating ahead in 2 Huth in proved territory and should have this well ready for a production test within another week or 10 days as the bit is going ahead at 3,750 ft. Amerada Petroleum, Standard Oil Co. and Western Exploration Co. have locations mapped for future wells to be drilled in this area. Up on Bethel Island, Tide Water Associated Oil Co. is drilling ahead in a sand and shale at 4,360 ft. in 1 Bethel Community but has not yet found a productive gas sand. On the Suisun Community lease in Solano County, Standard Oil Co. has just passed 4,000 ft. in No. 2-1 in 25-3n-1w, but has not yet found the anticipated pay. Union Oil Co. has location staked in 13-16s-11e, for a probable gas test in San Benito County but no drilling equipment has yet been placed on ground with the result that drilling operations will be delayed. Considerable difficulty is being experienced by most California prospectors in securing and keeping drilling crews as there is a shortage of capable experienced drillers most of whom have become employed in the various shipyards at higher salaries. All major companies have reduced the scope of drilling and at present Shell is down to two strings of tools, Union Oil Co. has cut development to three strings, Standard is down to about six and Richfield and Texas Co. are down to about five each.

Wildcat Activity

There has been no great change in the status of wildcat drilling in California during the past week although Amerada Petroleum Corp. is working on a good-looking prospect in the Wheatville district of Fresno County. This wildcat is 4-6 Truman in 6-17s-18e, which on a formation test yielded some 50-gravity oil and 10,000,000 cu. ft. of natural gas from the interval at 7,970-8,020 ft. The wildcat, drilled to 8,295 ft. but plugged back to 8,020 ft., is located in the general area where Amerada discovered the Helm and Riverdale fields within the past year. Helm and Riverdale do not look especially promising at the present time although both may contain a black oil sand lower in the structure in which event the several wells drilled to date could be considered as being located in a gas-cap area. In the Riverdale field, Amerada has carried its second well into the Cretaceous and is still going ahead at 10,500 ft. Drilling operations in the Raisin City field of Fresno County, have been reduced to the point where there is only one well drilling at the present time. This field, like Helm and Riverdale, does not look especially promising. Helm and Riverdale, however, only have a few wells drilled to date and may show an improvement but Raisin City has had enough to indicate that the accumulation is of secondary importance.

Panoche Test Nears Pay

In the Panoche district of Fresno County, Jergins Oil Corp. is approaching the point at which the pay should be encountered in 3 Cheney Ranch and from now on the hole will be cored solidly. This the third well to be drilled on the Cheney ranch in the Panoche district will be watched with extreme interest because the area has been subjected to a careful survey. The first well drilled by Jergins Oil Corp. proved to be good for a small amount of distillate from the Cretaceous and more than a year afterward the well is still making about 25 bbl. of light gravity distillate per day. The second test was shut down after considerable time was spent in attempting to finish a successful well. No definite opinion has been voiced as to whether the Panoche district is a distillate field, a spray petroleum gas accumulation or whether the wells drilled to date are located in a gas-cap area. Several interpretations can be placed on the showings of the first well and the subsequent failure of the second wildcat to find the pay even though it was whipstocked toward the original well. It remains to be seen whether this failure is due to structural conditions or a pinching out of the Cheney sands. While commenting on the possibility of Panoche being considered as a possible condensate field, it might not be amiss to mention that General Petroleum Corp. is making good progress in 61-33 Gallagher in 33-31s-26e, in the Paloma distillate field of Kern County with the result that the bit should reach the pay depth within another 30 days. This well is an outpost in the extreme northern end of the structure and for this reason a successful completion would greatly extend the productive limits of the field.

SAN JOAQUIN VALLEY COMPLETIONS

North Belridge, Kern County: Belridge Oil Co. 31-R-28 fee, 28-27s-20e, flowed 125 bbl., 34.3-gravity, 2 per cent cut, pressures 900/458 lb., T.D. 8,794 ft., perf. 8,491-8,794 ft., completed in second Wagonwheel zone of Eocene age.

Coalinga Nose, Fresno County: Standard Oil Co. 73-19-F fee, 19-20s-16e, flowed 1,080 bbl., 28.3-gravity, 0.5 per cent cut, 850,000 cu. ft. gas, 48/64-in. bean, flow pressure 450 lb., T.D. 7,800 ft., perf. 7,658-7,798 ft., Kreyenhagen 6,411 ft., green sand 7,580 ft., Gatchell oil sand of Eocene age 7,658-7,800 ft.

Coalinga, West, Fresno County: Westates Petroleum Corp. 16 Premier, 24-20s-14e, dry, T.D. 1,760 ft.

Midway-Sunset, Kern County: Doyle Petroleum Co. 1 Wilmar, 3-31s-22w, dry, T.D. 1,211 ft.

General Petroleum Corp. 343-35 Moco, 35-12n-24e, pumped 48 bbl., 16.1-gravity, 5 per cent cut, T.D. 975 ft., perf. 681-970 ft., completed in upper zone of Pliocene age.

General Petroleum Corp. 356-35 Moco, 35-12n-24e, pumped 37 bbl., 13.4-gravity, 25 per cent cut, T.D. 1,065 ft., perf. 636-1,064 ft., completed in upper zone of Pliocene age.

Richfield Oil Corp. 6 Belgian, 3-31s-22e, pumped 60 bbl., 13.1-gravity, 50 per cent cut, T.D. 1,450 ft., perf. 1,331-1,450 ft., completed in upper zone of Pliocene age.

Standard Oil Co. 107-15-D fee, 15-32s-24e, pumped 40 bbl., 25.9-gravity, 15 per cent cut, T.D. 3,225

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PORTLAND, MAINE

ft., perf. 3,091-3,221 ft., completed in Midway zone of Pliocene age.

Ten Section, Kern County: Shell Oil Co., Inc., 71-31-B Kern County Land, 31-30s-26e, flowed 2,077 bbl., 34-gravity, 0.5 per cent cut, 2,527,000 cu. ft. gas, pressures 210/1,350 lb., T.D. 8,220 ft., perf. 7,965-8,035 ft., 8,055-8,217 ft., N. Point 7,608 ft., Stevens oil sand 7,893-8,220 ft.

Tulare wildcat district, Tulare County: Richfield Oil Corp. 1-1 Tulare Community, 33-19s-24e, dry in slate basement 5,347-56 ft., T.D. 5,356 ft.

Ramona Wildcat Drilling Ahead After Disappointing Test

Continental's good-looking wildcat on the Ramona anticline in Ventura County has failed to come up to expectations and present plans contemplate a resumption of drilling. This wildcat, 1 Holser in 14-4n-18w, in the Piru area has over 200 ft. of oil sand but it appears Continental Oil Co. is having the same trouble that Chanslor-Canfield Midway Oil Co. is having in the Rincon field of Ventura County, that is a very tight formation. Continental has swabbed for several days, acidizing and then cleaning out but still no flow. This wildcat is bottomed at 4,344 ft. and top of the Modelo oil sand was logged at 4,105 ft. It is quite likely that the oil sand cored in 1 Holser may be the equivalent of the first Modelo zone of Miocene age that has been found in the Newhall Potrero, Alliso Canyon, Del Valle, Oak Canyon and other similar fields in northwestern Los Angeles County and not so very far east of Continental's Holser wildcat. If this is the case, deeper drilling may be productive of more favorable results.

Chanslor-Canfield Midway Oil Co. is making good progress with 10-C Hobson, a deep test being drilled in the Rincon field of Ventura County, but with the bit at 7,400 ft. the company still has another 3,000 ft. of hole to make before surpassing the depth reached in a previously drilled well at Rincon. Two previously drilled deep wells showed almost 1,000 ft. of oil sand but in both cases the zone was too tight to produce at a favorable rate. In the present attempt, Chanslor-Canfield Midway Oil Co. is prepared to go 15,000 ft. if necessary. The failure of Rincon to yield deeper productive zones is quite surprising inasmuch as it is located at the extreme western end of the prolific Ventura Avenue anticline along which have been found several fields and one of which is one of the greatest fields of its class in the world.

COASTAL DISTRICT COMPLETIONS

Santa Maria Valley, Santa Barbara County: F. E. Cole 2-1 Kemp, 31-10n-33w, dry, T.D. 5,021 ft.

Union Oil Co. 14 Union Sugar, 19-10n-34w, pumped 847 bbl., 18.2-gravity, 0.7 per cent cut, T.D. 5,152 ft., perf. 4,823-5,151 ft., completed in Monterey of Miocene age.

Summerland, Santa Barbara County: L. E. Stokes 1 Glenrey, 1-4n-26w, dry, T.D. 281 ft., cored tar zone but was too heavy and too viscous to produce.

Ventura-Newhall, Ventura County: Crude Oils, Inc., 1 Timber Canyon, 19-4n-20w, dry, T.D. 830 ft.

Hopland Oil Co. 1 Shiells Canyon, 1-3n-19w, dry, T.D. 4,634 ft.

D. V. Nelson 1 Piru, 19-4n-18w, dry, T.D. 1,702 ft., gas showing below 500 ft.

Second Buena Park Well Near Pay

The second well of Texas Co. in the Buena Park field of Orange County should reach the depth at which the discovery well was finished within the next week or 10 days and this project may indicate what may be expected in the eastern part of the Buena Park structure. The well in question is 1 Buena Park Unit 1 which is located east of the discovery well and is running about 150 ft. higher structurally than the discovery well. West of the discovery well and located lower structurally 4-E-1 Buena Park has just passed the 7,000-ft. level and therefore still has about 1,700 ft. to go before reaching the pay. Production in the field is coming from the equivalent of the Bell zone of Pliocene age which was first found productive in the Santa Fe Springs field a num-

(Continued on Page 83)

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NORTH CENTRAL TEXAS

Young County, Mississippi Lime Trend Widened to West

By ROBERT INGRAM

WICHITA FALLS, Tex.—Deep production in Young County was moved westward again last week as Shell Oil Co., Inc., 1 Bullock, a wildcat 7 miles northwest of Newcastle in Block 343, T.E.&L. Survey, showed for commercial production from the Mississippian lime and was being deepened for a test of the Ellenburger. The well is 7 miles southwest of the Burns-Larimore pool which was opened to Mississippian production a year ago.

Shell's well topped the Mississippian at 4,748 ft. and drilled lime showing oil from 4,748 ft. to 4,820 ft. A 15-minute drill-stem test at 4,753-4,820 ft. showed gas in 3 minutes, flowed oil in 14 minutes, and continued to flow for 17 minutes. Ellenburger is expected at around 4,900 ft. or 5,000 ft.

A number of shallow dry holes have been drilled close to the discovery, but the deepest went only to 1,515 ft. Nearest deep production, at the Burns-Larimore pool, is apparently a similar local structure where the pay zone was found in the discovery well at 4,797-4,927 ft. Although the discovery well at this field had an initial potential of 224 bbl. in 3 hours through ¾-in. choke, other wells have been small and the six producers are classed in the current proration order as marginal.

Second Well at Jack Discovery

In southeastern Jack County, Steed & Cooper 1 Flowers, D. Crenshaw Survey, south offset to Joe A. Worsham 1 C. Sewell, Marble Falls discovery, 5 miles southeast of Jacksboro, was being drilled in at 4,716 ft. It topped sand at 4,691 ft. and drilled sand showing oil to 4,694 ft. Core at 4,694-4,704 ft. recovered 7 ft. of saturated sand, and core at 4,704-16 ft., total depth, recovered 7 ft. of dry, hard, broken sand. A 30-minute drill-stem test at 4,687-4,716 ft. showed gas in 4 minutes, sprayed oil in 16 minutes with recovery of 200 ft. of oil and 90 ft. of oil-cut mud. Casing will be run for completion. The discovery well, completed the first week in May, made a potential of 42 bbl. in 6 hours, flowing through ¼-in. tubing choke, natural.

Joe Worsham 1 Hensley, T. Martinez Survey, prospective pool opener to the southwest (See The Oil and Gas Journal, June 11, 1942, p. 80) was thinning mud and getting ready to fish.

Grayson Well Still Trying

Although the well had been reported completed as a dry hole, Talbot & Finston 1 Jewell, William Allen Survey A-15, 8 miles northeast of Whitesboro in Grayson County, was being readied for a pumping test from the 7,168-7,209-ft. show. Denver Producing & Refining Co., are drilling it. Albert Finston of Tulsa, one of the interested parties, said there was between 4,000 ft. and 6,000 ft. of 34-gravity oil standing in the hole and tubing and rods had been run and pumping unit set. Tankage also had been built, he said. The well was drilled to a total depth of 8,403 ft., then plugged back to 7,209 ft. for the test. After being shut in for 2 weeks after acid treatment, the well showed both oil and gas.

NORTH CENTRAL TEXAS COMPLETIONS

Wildcats

Archer County: Craig & Wilson 1 A. J. Ikard, 330 ft. from S and E lines of W. L. Porter Sur. A-1074, dry, T.D. 1,154 ft.

King County: Mid-Continent 1 S. B. Burnett est., 311 ft. from E line and 1,655 ft. from S line Sec. 16, H.&T.C. Sur., Blk. F, Mississippian 5,852 ft., Ellenburger 6,135 ft., T.D. 6,180 ft.

Montague County: Sinclair Prairie 1 C. R. Henderson, 567 ft. from N and E lines of S cor. J. M. Hodges Sur. A-964, but in W. E. Martin Sur. A-1111, 1¼ mi. E of Denver, junked, tested 1,350 ft. oil in 30-min. D.S. test at 6,070-85 ft. in lime, T.D. 6,935 ft.

Fields

Craig, Young County: A. T. Strong 2 E. C. Stovall, 660 ft. from W line and 100 ft. from S line Sec. 2947, T.E.&L. Sur., 6 mi. W of Newcastle, flowed 35 bbl. oil and 250 bbl. water, perf. 4,705-80 ft., T.D. 5,000 ft., P.B. 4,820 ft., *second well in May 1940, discovery ¾ mi. southeast*

Joy, Clay County: Shell 1 Mattie Clark, 2,129 ft. from S line and 1,087 ft. from W line Lot 25, H. Williams Sur. A-704, flowed 704 bbl. oil and 213 bbl. water in 17 hr. after acid, lime pay 6,055-87 ft., T.D. 6,087 ft.

K.M.A.-Ellenburger, Wichita County: Shell and Phillips 44 N. C. Griffin, 3,208 ft. from N line and 5,067 ft. from E line 860-acre tract in F. Jordan heirs Sur. A-167, flowed 2,712 bbl. through tubing after acid, pay 4,327 ft., T.D. 4,360 ft.

Sunray 17-E Mangold, 450 ft. from W line and 600 ft. from S line of N½ of Lot 37, Mangold subd., F. Castleman Sur. A-35, flowed 2,349 bbl. through ½-in. tubing choke after acid, pay 4,268 ft., T.D. 4,362 ft.

Thornberry, Clay County: Akin, Dimock & Costley 2 J. B. Patrick-C, 330 ft. from W line and 1,700 ft. from N line Sec. 82, Byers subd., dry, T.D. 1,323 ft.

Miscellaneous

Archer County: Morgan & Turner 11 R. J. Andrews, 1,050 ft. from N line and 612 ft. from W line Sec. 2437 ft., T.E.&L. Sur., pumped 30 bbl., pay 1,407 ft., T.D. 1,416 ft.

Van Wormer and Phillips 2 Falls Co., 350 ft. from W line and 400 ft. from N line of east 47 acres of Sec. 63, Falls C.S.L. Sur. pumped 5 bbl., sand 1,168 ft., T.D. 1,175 ft.

Cooke County: S. H. Fagadau 1 A. Weisman, 1,030 ft. from W line and 4,100 ft from S line O. F. Leverett Sur. A-607, dry, T.D. 765 ft.

Second Test in Coker Pool Shows Heavy Gas

FORT WORTH, Tex.—Second well in the new Coker pool of Coleman County (for which field rules were published by the Railroad Commission) showed heavy gas and a spray of oil after drilling 12 ft. of Morris sand to 3,036 ft. last week. It was Anderson-Prichard 1 M. L. Coker, NE SW Section 72, Block 2, G.H.&H. Survey. Operator had not yet decided whether to drill deeper or complete.

Meantime rig was being moved in for C. T. Owens et al 2 Coker, also in Section 72. C. T. Owens et al 1 Coker opened the pool in May.

Slight Show at Stephens Test

In northern Stephens County, Texas Pacific Coal & Oil Co. 1 Donnell, Section 1208, T.E.&L. Survey, close to the Young County line, showed salt water with a small amount of oil after being

(Continued on Page 79)

EASTERN TEXAS

Wood County Paluxy Find Is Of Major Importance

By ROBERT INGRAM

DALLAS, Tex.—Official gage at Amerada Petroleum Corp. 1 Kennemer, Paluxy sand discovery in the Joseph Knight Survey, Wood County, showed it flowing at the rate of 1,920 bbl. a day. This was based on a 4-hour test during which it flowed 320 bbl. through 2-in. open tubing. Gravity was 27.5°. Tubing pressure was 95 lb., shut-in casing pressure, 225 lb., and the gas-oil ratio was 107:1. The well was shut in for 6 hours, and pressure rose on the tubing to 300 lb. and on the casing to 400 lb. Lease storage was filled, and the well again shut in.

On a previous gage it flowed 536 bbl. in 3 hours, but this was through two flow lines, one from the tubing and the other from the casing. Amerada was preparing to submit a spacing pattern to the Railroad Commission, and two other tests were being started, but no pipe-line connection was reported. The new field, which will probably be named after the nearby community of Coke, is 25 miles northwest of Hawkins, the closest pipe line for handling asphalt-base crude, and 10 miles west of the Gulf Pipe Line Co. trunk line which has been reversed to flow north during the war.

The discovery was viewed as the most important of the year in eastern Texas not only because it had the largest initial potential of any Paluxy sand well in the state, but also because it opened the first Paluxy oil field south of the fault system in the Tyler Woodbine basin. Nevertheless, 40-acre spacing together with current low allowables kept the play from running wild.

Two offsets were started. One was American Oil Co. 1 Dora Rodney, 660 ft. from the north and east lines of a 50-acre tract, Manuel Y'Barbo Survey, 2,600 ft. west and slightly north of the discovery. The other was Jerry Hawkins 1 Baker, Smith Survey, northeast of the discovery well, building derrick and moving in rig.

At the same time a new lease play sprang up around the Alba prospect on the Wood-Rains county line with Magnolia Petroleum Co., Seaboard Oil Co., Navarro Oil Co., and Jess Bohon (probably for Stanolind Oil & Gas Co.) taking leases. The Alba prospect has been tested for Woodbine pay without success, but it is a recognizable structure and the new buying is based on deeper pay chances.

Wildcat Progress

Bobby Manziel et al 1 Levine, M. M. Sanchez Survey, 3 miles north of Malakoff in southwestern Henderson County, was conditioning hole prior to taking side-wall cores in a 10-ft. section of Woodbine sand showing production at 4,022-32 ft. . . . A mile northwest outpost in the Concord Woodbine sand pool of Anderson County was started at Magnolia Petroleum 1 H. E. Fitzgerald, J. N. Fitzgerald Survey. . . . A short east extension at Hawkins was indicated by Keys & Phillips 1 Green heirs, Crain Survey, which logged 86 ft. of sand in drilling to 4,860 ft.

EAST TEXAS COMPLETIONS

Wildcats

Angelina County: Coastal Refineries, Inc., 1 G. Hen-

(Continued on Page 76)

SOUTHWEST TEXAS

Wilcox Sand Discovery in Wilson County Is Pumper

By F. L. SINGLETON

CORPUS CHRISTI, Tex.—Holland Oil Co. 1 Boysen, located on the updip sector of the Wilcox trend in Southwest Texas, 5 miles northeast of the town of Poth, Wilson County, has been placed on the pump and at the close of the week was pumping at the rate of 4 bbl. of fluid per hour of which 80 per cent was oil. Whether or not salt water accompanied the fluid was not reported. Production is through perforated casing opposite the Wilcox sand at 4,091-96 ft. With the exception of some minor shallow production in the Floresville area, this is the first producing area for the county, and although completed as a pumper, the showing is expected to result in an increase in exploration along this particular area.

In line with this development, Royal Oil & Gas Co. 1 Mathews, 12 miles southeast of the town of Cotulla, La Salle County, was bottomed at 4,714 ft., and preparations were being made to drill-stem test a sand section at 4,706-14 ft., which is reported to have shown from 5 to 7 per cent saturation. This is believed to be the Wilcox although the top of the formation was not reported.

Oil and Gas Show Logged In Dimmit County Test

Four miles northeast of Asherton, Dimmit County, showings of oil and gas were logged in Humble 1 Denton, Blas Reyes Survey. Sandy shale with oil and gas show was cored at intervals from 5,034-58 ft., but a 20-minute drill-stem test at 4,998-5,058 ft. recovered 40 ft. of drilling mud with no working pressure and the well is coring ahead in sandy shale below 5,115 ft.

In Lee County, 4 miles west of Fields Station. Holland Oil Co. 1 Richter, L. P. Rucker Survey, logged an oil odor in the Georgetown lime at 6,564-74 ft., and a 15-minute drill-stem test at 6,564-74 ft. tested a slight blow and 30 ft. of drilling mud was recovered. The well is coring ahead below 6,800 ft.

Tide Water Associated 1 Gips, a prospective Wilcox sand pool opener, 10 miles southwest of the town of Yorktown, De Witt County, was temporarily shut down at 7,700 ft. following the running of an electrical survey. Details as to what the survey showed were not available but a decision as to whether the well will be drilled deeper or casing cemented for testing of sands already logged was to be made the first of the week. The first sand in the Wilcox was topped at 7,000 ft., and the section showed gas or distillate to a total depth of 7,037 ft. The well topped the Hockleyensis at 3,250 ft., Dibollensis at 3,850 ft., Cockfield 3,940 ft., Discorbis Yeguaensis 4,060 ft., Eponides Yeguaensis 4,150 ft., Ceratobulimina 4,730 ft.. Operculina 4,820 ft., and the Midway at 5,330 ft.

Seeligson Extension Opens Shallow Producing Sand

Humble 1 King, 3,900 ft. northeast of the Seeligson field, Kleberg County, topped the 5,200-ft. pay in the field proper at 5,208 ft., and a 43-minute drill-stem test at 5,213-23 ft., recovered 5,000 ft. of pipe-line oil and tested 25-lb. working pressure. This well definitely opens an important extension to the field and opens production from a new and shallower sand for the structure. The new sand was topped at approximately 4,640 ft., and was cored practically solid to a depth of 4,684 ft. Drill-stem testing at various intervals recovered pipe-line oil.

H. R. Smith 1 Kohler, about 1½ miles from the Orange Grove field, Jim Wells County, originally completed as a gas well at 5,065-72 ft., has been recompleted in a new sand at 4,865-70 ft., and is flowing into the pits through a 7/64-in. choke. Drill-stem testing recovered 1,000 ft. of 28.1-gravity oil. An electrical survey of the sand, which was not cored, showed the section to have a thickness of 15 ft.

SOUTHWEST TEXAS COMPLETIONS
LOWER GULF COAST DISTRICT

Wildcats

Nueces County: Premont 1 Clara Driscoll, dry, T.D. 7,086 ft.

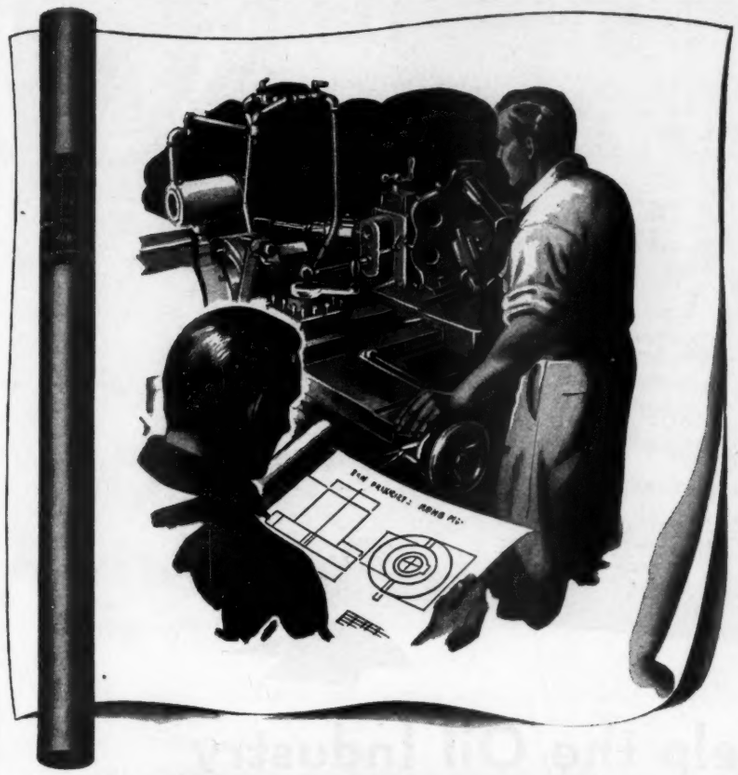
Fields

Agua Dulce, Nueces County: Stanolind 6 Weinert, 320 bbl., ¼-in. choke, perf. casing 6,417-27 ft., T.D. 6,440 ft.

Heard, Bee County: Shield 2 Heard, dry, T.D. 5,360 ft.

Odem, San Patricio County: Seaboard 5 Bonner, 64 bbl., ¼-in. choke, perf. casing 5,326-29 ft., T.D. 5,530 ft.

(Continued on Page 84)



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PITTSBURGH, Pa.—The test of John T. Galey et al on the Miller and Myers lease in Slippery Rock Township, Lawrence County, topped the Onondaga lime at 4,506 ft., steel-line measurement. Starting at a surface elevation of 1,207 ft., it places this member 3,299 ft. subsea or over 20 ft. higher than the test on the Heickel farm which had 68,000 cu. ft. of gas in the Oriskany sand followed by water. The new test reached 4,625 ft. when the shaft of the sand reel broke dropping the bailer and the line into the hole. It is now being fished.

On the Fayette anticline in South Huntington Township, Fayette County, Peoples Natural Gas Co. is drilling at 7,939 ft., or 37 ft. below the top of the Oriskany sand which so far has been dry.

Manifold installation in East Cromwell Field, Oklahoma

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SOUTHWEST PENNSYLVANIA COMPLETIONS

Armstrong County, Kittanning Township: Equitable Gas Co. 1 Boarts & Yount, 14,000 cu. ft. gas, Bradford sand 3,030-67 ft., gas 3,032 ft., T.D. 3,308 ft.

Clarion County, Porter Township: Sedgewick & Crumb 1 J. R. Males, 650,000 cu. ft. gas, Hundred Foot sand, T.D. 1,065 ft.

Washington County, South Franklin Township: Foley & Williams 1 Robert S. Holbert, 628,000 cu. ft. gas, Little Dunkard 940 ft., gas show 956-67 ft., gas 985 ft., T.D. 985 ft.

Westmoreland County, Washington Township: J. K. Sharp 1 Frank Coulter, 70,000 cu. ft. gas, Speechley sand, T.D. 3,760 ft.

WEST VIRGINIA

In Grant district, Ritchie County, Benedum & Trees ran 7-in. casing to 5,663 ft. in the deep test on the L. J. Rinehart farm, with the top of the Corniferous lime at 5,641 ft., cable-tool measurement. In Meade district, Tyler County, these operators have a bad fishing job in the test on the Pearl Broadwater farm after a gas pocket at 5,950-56 ft.

WEST VIRGINIA COMPLETIONS

Braxton County, Otter district: Pittsburgh & West Virginia Gas Co. 7391 G. B. Howell, drilled deeper, dry, started 1,768 ft., Rose salt 1,830-85 ft., Maxton 1,895-1,920 ft., Blue Monday 1,987-90 ft., Big lime 2,020-80 ft., Big Injun 2,080-2,195 ft., show gas 2,158-59 ft., Berea 2,350-87 ft., T.D. 2,622 ft.

Calhoun County, Sherman district: Clem S. Morris 1 Paris VanCamp, 671,000 cu. ft. gas, third Salt 1,629-39 ft., gas 1,631-39 ft., T.D. 1,639 ft.

Lincoln County, Duval district: Brawley Reid Oil & Gas Co. 2 Horse Creek Land & Mining Co., Injun gas 100,000 cu. ft., Berea gas 198,000 cu. ft., Big lime 1,572-1,772 ft., Big Injun 1,772-1,820 ft., Berea 2,259-84 ft., shot 2,259-84 ft., R.P. lime and Injun 400 lb., Berea 220 lb., T.D. 2,295 ft.

Ritchie County, Clay district: Pine Valley Producing Co., Inc., 1 Strickler & McGinnis, 1 bbl., former gas well gaging 50,000 cu. ft. gas was drowned out by oil, Gordon sand, T.D. 2,400 ft.

Union district: Hope Natural Gas Co. 8614 Sarah F. Randolph, 1,400,000 cu. ft. gas, Maxton sand 1,630 ft., T.D. 1,674 ft.

Roane County, Reedy district: O. H. Reed 1 Annis Young, dry, Little Dunkard 1,200-20 ft., sand 1,480-1,565 ft., Salt sand 1,955-2,240 ft., Berea 2,610-13 ft., T.D. 2,640 ft.

Upshur County, Meade district: Cumberland & Allegheny Gas Co. 320 C. W. Elmer, 1,084,000 cu. ft. gas, Fifth sand 2,360-79 ft., gas 2,367 ft., T.D. 2,380 ft.

Wayne County, Union district: Owens, Libby-Owens 1 Hiram Ferguson, 84,000 cu. ft. gas, Big lime 1,319-1,494 ft., Injun 1,494-1,575 ft., Berea 2,133-58 ft., brown shale 2,227-55 ft., brown shale 2,565-2,656 ft., brown shale 2,691-3,029 ft., shot 2,564-3,029 ft., R.P. 515 lb., T.D. 3,272 ft.

Wood County, Walker district: Clifton Oil & Gas Co. 2 Volcanic Oil & Coal Co., 10 bbl., stray sand 1,377-85 ft., T.D. 1,388 ft.

ORISKANY GAS FIELDS

Jackson County, Ravenswood district: Columbian Carbon Co. 1-B Jackson County Bank, 7,117,000 cu. ft. gas, elev. 948 ft., Salt 2,002-60 ft., Corniferous 5,209-5,334 ft., Oriskany 5,334 ft., shot 5,334-47 ft., T.D. 5,412 ft.

Ripley district: United Carbon Co. 13 E. W. Perkins, 11,888,000 cu. ft. gas before shot, Corniferous 5,184-5,289 ft., Oriskany 5,289 ft., gas 5,289-5,311 ft., T.D. 5,311 ft., R.P. 1,815 lb.

United Carbon Co. 1 O. M. Lewis, 5,628,000 cu. ft. gas, Corniferous 5,031-5,133 ft., Oriskany 5,133-74 ft., R.P. 1,310 lb., shot 5,141-54 ft., T.D. 5,183 ft.

Godfrey L. Cabot, Inc., 32 Putnam Co., 4,720,000 cu. ft. gas, Corniferous 4,931 ft., Oriskany 5,040 ft., shot 5,040-60 ft., R.P. 1,575 lb., T.D. 5,113 ft.

Eastern Texas Fields

(Continued from Page 74)

derson, J. Watson Sur., 11 mi. W of Lufkin, dry, Queen City 891 ft., Wilcox 1,150 ft., Midway 3,270 ft., Carrizo 4,100 ft.

Henderson County, Texas 1 E. T. Brown, Armstead Eans Sur., dry, Austin chalk 4,000 ft., sub-Clarksville 4,310 ft., Woodbine 4,538 ft., Georgetown lime 5,464 ft., hard Georgetown lime 5,533 ft., Glen Rose 7,495 ft., T.D. 9,965 ft.

Fields

East Texas field, Joiner area, Rusk County: Roosth & Genecov 1-A Neal Cooper, 710 ft. from N and 375 ft. from E line of T. J. Moore Sur., pumped 18.5 bbl., sand 3,567 ft., T.D. 3,588 ft.

Hawkins, Wood County: Humble 1-B W. G. Dagnel, M. A. Esparcia Sur., flowed 80.87 bbl. in 6 hr. through ¼-in. choke, T.D. 4,910 ft.

Kildare, Cass County: C. C. Gilger 1-A Grogan Mfg. Co., John Watson Sur., flowed 216 bbl. through ¼-in. tubing choke, T.D. 6,050 ft., *north offset to discovery.*

OKLAHOMA FIELD REPORT

Small Skinner Sand Discovery Reported From Creek County

By CARL HOOT

DRILLING activity in Oklahoma continues at a good pace, including wildcat operations, but field completions for the week were lagging. Eight wildcats finaled were dry. Extensions were reported for Apache, Cumberland, and Navina pools.

New production was found in Creek County with the completion of J. E. Crosbie 1 Daily, SE NE NW 12-18-7, which pumped 25 bbl. of oil a day from Skinner sand at 2,648-72 ft.

The Hotulke pool of Pottawatomie County, which has spread rapidly over Sections 23, 24, 25, and 26-9n-4e, received its first failures last week. On the south edge of the field, H. L. Berkley 1 Pack, SE SE SW 26-9-4, while not a dry hole, pumped 5 bbl. of oil from Viola lime at 4,353 ft. Nearer the center of the field and offsetting two good wells, W. E. Brown 1 Bowling, SE NW 25-9-4, was dry at total depth of 4,156 ft. Continental Oil Co. 1 Hallum, SW NW NE 6-8n-5e, a wildcat 1½ miles southeast of Hotulke and on the northern tip of the Maud district, was dry at 4,421 ft. Hunton was found at 4,107 ft., with no shows.

A wildcat test 1 mile southeast of the new Centerpoint pool, was dry at 5,827 ft. Simpson dolomite at 5,630 ft., the same depth at which production was found in the Centerpoint discovery well, had no shows and the well was abandoned in the second Wilcox.

Also in Pottawatomie County, Atlantic Refining Co. 1 Hamil, NE SW 27-8-3, discovery well of a new Hunton pool, cored from 5,243 to 5,253 ft. in the second Wilcox but was preparing to run casing and perforate in Hunton lime topped at 4,598 ft., from which the well had previously flowed some 100 bbl. of oil an hour on drill-stem test. Location is 4 miles south of the Brooksville pool.

Midway between Crescent and Edmond in Logan and Oklahoma counties, the Navina pool, developed by Cities Service Oil Co., has promises of becoming a major pool. The third well for the new pool was 1 Cavanaugh, SW cor. 2-15n-4w, which flowed 316 bbl. a day from Laton sand at 5,047 ft. Production in the other two wells is from Layton at 5,007 and 5,010 ft.

The Apache pool of Caddo County was extended ¼ mile northwest by Amerada 1 Hunter, SE SE 34-6-12w, which flowed a total of 1,333 bbl. through choke over 7¼ hours' testing. The well ran considerably lower than average for the field, with pay from Simpson at 3,620-3,892 ft.

OKLAHOMA COMPLETIONS

Wildcats

Creek County: J. E. Crosbie 1 Daily, SE NE NW 12-18-7, pumped 25 bbl., Skinner 2,648-72 ft.

Hughes County: Phillips 1 Ross, NE SE 18-5-10, drv, T.D. 4,622 ft., Gilcrease 3,892 ft., Cromwell 4,465 ft., second Cromwell 4,596 ft.

Kay County: Creekmore-Rooney 1 Cline, SE NW NE 29-27-4, dry, T.D. 3,309 ft., Oswego 2,932 ft., Bartlesville 3,246 ft., Mayes 3,308 ft.

Jackson County: Mutual Oil 1-A Caves, NW NW NE 36-4-21w, dry, T.D. 1,764 ft.

Kiowa County, 1 mi. S of Hobart pool: Bud Lewis 1 Jones, SW SW NE 29-7-17w, dry, T.D. 1,163 ft.

Lincoln County: Dunnett Oil 1 Strickley, SW SW NE 24-13-2, dry, T.D. 5,642 ft., Oswego 4,570 ft., Mayes 5,140 ft., Hunton 5,333 ft., Sylvan 5,368 ft., Viola 5,470 ft., Wilcox 5,564 ft., second Wilcox 5,632 ft.

Pottawatomie County, 1½ mi. SE Hotulke: Continental 1 Hallum, SW NW NE 6-8-5, dry, T.D. 4,421 ft., Mayes 3,948 ft., Woodford 3,975 ft., Misener 4,098 ft., Hunton 4,107 ft.

One mile SE of Centerpoint: Liggott and Stanolind 1 Cofer, NE NE NW 18-9-3, dry, T.D. 5,827 ft., Oswego 4,630 ft., Earlsboro 4,815 ft., Mayes 5,115 ft., Woodford 5,160 ft., Misener 5,260 ft., Hunton 5,262 ft., Viola 5,530 ft., dense 5,585 ft., Simpson dolomite 5,630 ft., Wilcox 5,710 ft., second Wilcox 5,803 ft.

Seminole County: Stanolind 1 Johnson, NW NW SE 28-9-8, dry, T.D. 4,393 ft., Cromwell 3,446 ft., Mayes 3,980 ft., Woodford 4,090 ft., Misener 4,145 ft., Hunton 4,165 ft., Viola 4,290 ft., Wilcox 4,375 ft.

Fields

Apache, Caddo County: Amerada 1 Hunter, SE SE 34-6-12w, flowed 736 bbl. through choke in 4 hr., 1,333 bbl. in 7¼ hr., 2,000,000 cu. ft. gas, Simpson sand 3,620-3,892 ft., T.D. 3,911 ft.

Cumberland, Marshall County: Pure 4 Little-101, SE SE SW 28-5s-7, flowed 196 bbl. through choke, McLish 5,785-5,950 ft., T.D. 5,960 ft.

Dilworth, Kay County: National Union 4 Hockman, SW NE SE 19-28-1, pumped 56 bbl., Wilcox 3,375-98 ft., T.D. 3,400 ft.

Hotulke, Pottawatomie County: W. E. Brown 1 Bowling, SE NW 25-9-4, dry, T.D. 4,156 ft.

H. L. Berkley 1 Pack, SE SE SW 26-9-4, pumped 5 bbl., Viola 4,353-4,414 ft.

Navina, Logan County: Cities Service 1 Cavanaugh, SW cor. 2-15-4w, flowed 316 bbl., Layton 5,047-85 ft.

St. Louis, Pottawatomie County: Kerlyn et al 1 Martin, NW NE SE 8-7-5, dry, T.D. 4,323 ft.

Atlantic 6 Burke, NE NE 16-7-4, flowed 15 bbl., Earlsboro 3,515-30 ft., T.D. 3,565 ft.

Miscellaneous

Black Jack et al 2 Isles, SE SW NE 1-19-9, pumped 6 bbl., sand 1,984 ft., T.D. 2,010 ft.

D. B. Malernee 2 Roundtree, SW SW 2-14-7, flowed 86 bbl., pay 3,144-48 ft.

(Continued on Page 82)

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Thick McClosky Pay Found In Wayne County Discovery

MATTOON, Ill.—Deep Rock Oil Corp. is continuing to explore the thick McClosky lime at its discovery, 1 L. A. Blackburn, NW NE 30-1s-7w, Wayne County. When plug was drilled to the McClosky at 3,238-40 ft., the hole filled with oil and the well headed up and began to flow. After being shut in a short time for tankage, it made 414 bbl. in 10 hours. After being deepened to 3,247 ft. the next day, it flowed 848 bbl. in 16½ hours.

The test was then deepened to 3,252 ft. and made 1,000 bbl. in a short period, and while being deepened from 3,252-56 ft. it flowed 1,050 bbl. in 24 hours. Present depth of the well is 3,263 ft. and it continues to flow at a rate better than 1,000 bbl. daily. Nearest production to the 1 Blackburn is in the Boyleston pool, 3 miles to the east.

Deep Rock has made two other locations in the area, 1 Sanford, SW NE 30-1s-7e, and 2 Sanford, SE NE 30-1s-7e. An east offset to the discovery, Gulf 1 Blackburn, NE NE 30-1s-7e, is drilling below 2,480 ft.

Wildcat May Open New Pool in Long-Dormant Washington County

Prospects for a new pool in Washington County, the first in many months, appeared bright last week as operators at Gulf 1 Leffner, NW NE NW 13-3s-2w, were attempting to decide where to set pipe after an electric log revealed saturation in both the Benoist and Cypress sands.

According to operators at the test, fair Cypress pay was encountered at 1,181 ft. and broken saturation was recovered in the Benoist at about 1,347-59 ft. The well was drilled into the St. Louis lime to a total depth of 1,685 ft. and a test made of the McClosky. This formation was found to be dry, however, and operators decided to plug back to test the sand horizons.

Meanwhile, another wildcat in the county, Harry Hubbard 1 Mozelewski, SW SW SW 15-3s-2w, about 2 miles west of the prospective pool opener, was drilling below 1,000 ft. and nearing the Benoist.

Clinton County Active

After 20 years of inactivity, the Frog Town pool of Clinton County may have a new producer. It is the Gus Berry 1 Hoffsomer, NE SE 12-2n-4e, where 13 ft. of good Cypress sand saturation was encountered and casing set. Although this operation was originally slated to be a Devonian test, the good Cypress saturation, abandoned horizon of the old pool work, caused operators to set casing there. The casing was set to 958 ft. and total depth of the hole is 971 ft.

Meanwhile, operations in the new Boulder pool of the county continues at a fast pace with the Texas Co. doing most of the work. Recent torrential rains, however, will probably hold up work for a day or so.

One of the most interesting wells in White County at present is Ivan White et al 1 Lomas. SW NW SW 14-4s-14w, on the extreme east side of the New Harmony pool and near the Wabash River. The test was abandoned in July 1941 but recently was reworked and after casing perforations opposite the Tar Springs at 2,228-42 ft. is swabbing 4 bbl. of oil an hour. Apparent success of this well has revived the hope that eventually the pool may be extended across the river into Indiana as it is farther north.

ILLINOIS COMPLETIONS

Wildcats

Bond County: Charles Beck 1 G. W. Wills, SW SE SE 33-6n-2w, location abandoned.

Edwards County: S. C. Yingling 1 M. Perkins, NE SW SW 2-3s-10e, dry at 1,972 ft., Biehl sand 1,953 ft., T.D. 1,972 ft.

C. F. Steele 1 C. Couch, SW SE SE 6-1s-11e, pumped 10 bbl. oil and 75 bbl water, 500 gal. acid, Ste. Genevieve 3,216 ft., T.D. 3,261 ft.

Central P. L. 1 Tarpley, NW NE NW 31-1n-14w, dry at 3,220 ft., Menard 2,340 ft., Waltersburg 2,407 ft., Glen Dean 2,674 ft., Cypress 2,803 ft., Paint Creek 2,901 ft., Benoist 2,931 ft., Renault 3,013 ft., Aux Vases 3,072 ft., Ste. Genevieve 3,119 ft., McClosky 3,176 ft.

Franklin County: Menhall 1 Old Ben Coal, NW NE NW 25-5s-1e, pumped 50 bbl., 30-qt. shot 2,697-2,707 ft., Aux Vases sand 2,690-2,708 ft., T.D. 2,882 ft., P.B. 2,707 ft., *pool opener.*

E. S. Adkins 1-M L. Morey, SE SW NW 34-7s-3e, dry at 3,187 ft., base Pennsylvanian 1,625 ft., Kincaid 1,625 ft., Degonia 1,787 ft., Clore 1,831 ft., Palestine 1,869 ft., Menard 2,017 ft., Waltersburg 2,092 ft., Vienna 2,162 ft., Tar Springs 2,195 ft., Glen Dean 2,270 ft., Hardinsburg 2,326 ft., Golconda 2,380 ft., Barlow 2,540 ft., Cypress 2,559 ft., Weiler 2,617 ft., Paint Creek sand 2,722 ft., Benoist 2,772 ft., Aux Vases 2,811 ft., McClosky 2,996 ft.

Gallatin County: P. A. Murelle 1 E. Fitzgibbons, SW SW SW 24-10s-9e, dry at 2,037 ft., Kincaid 1,900 ft., Degonia 1,990 ft., Clore 2,021 ft., Palestine 2,030 ft.

Hamilton County: Texas 1 C. E. Epperson, SE SE 4-9s-7e, dry at 3,510 ft., Menard 2,465 ft., Tar Springs 2,630 ft., Glen Dean 2,690 ft., Hardinsburg 2,740 ft., Golconda 2,808 ft., Ste. Genevieve 3,313 ft., Fredonia 3,389 ft., St. Louis 3,505 ft.

B. M. Heath 1 Clemm, NE SE 35-5s-7e dry at 2,480 ft., Kincaid 2,232 ft., Menard 2,480 ft., Glen Dean 2,737 ft., Hardinsburg 2,772 ft., Barlow 2,974 ft., Weiler 3,052 ft., Benoist 3,190 ft., Renault 3,292 ft., Aux Vases 3,301 ft., Ste. Genevieve 3,357 ft., St. Louis 3,405 ft.

Jefferson County: Arrow Drlg. and Fisher 1 Wimberly Comm., SE NW 22-1s-3e, dry at 2,827 ft., Glen Dean 2,166 ft., Golconda 2,259 ft., Cypress 2,374 ft., Weiler 2,397 ft., Paint Creek 2,539 ft., Ste. Genevieve 2,678 ft., Fredonia 2,731 ft., McClosky 2,773 ft.

Perry County: Stevens & Ward 1 Albers, SE SE SE 32-4s-2w, dry at 1,446 ft., Menard 755 ft., Benoist 1,340 ft.

Washington County: C. V. Richardson et al 1 Glozik et al, S½ SW SW 26-3s-2w, dry at 1,582 ft., Menard 770 ft., Glen Dean 905 ft., Barlow 1,105 ft., Benoist 1,287 ft., Aux Vases 1,356 ft., Rosiclare 1,441 ft., Fredonia 1,494 ft., McClosky 1,516 ft., St. Louis 1,560 ft.

Wayne County: E. Wilson et al 1 Ward, SE NE 15-1n-5e, dry at 3,102 ft., Kincaid 1,889 ft., Degonia 1,979 ft., Menard 2,204 ft., Tar Springs 2,332 ft., Glen Dean 2,334 ft., Hardinsburg 2,354 ft., Golconda 2,497 ft., Barlow 2,601 ft., Benoist 2,825 ft., Renault 2,859 ft., Aux Vases 2,895 ft., Ste. Genevieve 2,946 ft., McClosky 3,005 ft., St. Louis 3,080 ft.

J. W. Carter et al 1 Fartharee, NE SW NE 31-2n-5e, dry at 3,145 ft., Kincaid 1,986 ft., Menard 2,225 ft., Glen Dean 2,438 ft., Golconda 2,484 ft., Barlow 2,644 ft., Cypress 2,661 ft., Paint Creek 2,765 ft., Benoist 2,826 ft., Renault 2,867 ft., Aux Vases 2,939 ft., Ste. Genevieve 2,960 ft., Fredonia 3,032 ft., St. Louis 3,114 ft.

Texas 1 Miles, W½ NW SW 4-2s-2e, dry at 3,281 ft., Glen Dean 2,590 ft., Golconda 2,695 ft., Barlow 2,785 ft., Cypress 2,805 ft., Benoist 2,980 ft., Ste. Genevieve 3,160 ft., Rosiclare 3,182 ft., Fredonia 3,192 ft., McClosky 3,194 ft.

Fields

Bone Gap, Edwards County: Tide Water 4 Gawthrop, W½ NE SW 18-1s-11e, pumped 95 bbl., perf. 3,186-90 ft., 500 gal. acid, McClosky 3,173-76 ft., 3,186-92 ft., T.D. 3,213 ft.

Tide Water 1 Hocking, W½ SE NW 7-1s-11e, pumped 118 bbl., perf. 3,199-3,205 ft., 1,000 gal. acid, McClosky 3,199-3,208 ft., T.D. 3,208 ft.

Coil, Wayne County: Central P. L. 1 Edmonson, SW SW 17-1s-5e, dry at 3,086 ft., Glen Dean 2,437 ft., Hardinsburg 2,454 ft., Cypress 2,640 ft., Weiler 2,689 ft., Benoist 2,903 ft., Aux Vases 2,936 ft., Ste. Genevieve 2,984 ft., McClosky 3,049 ft.

Dale, Hamilton County: Shell 1 G. W. Morris, NW NE NW 18-6s-7e, flowed 218 bbl., 25-qt. shot 3,044-61 ft., 10-qt. shot 3,029-36 ft., Aux Vases 3,012 ft., T.D. 3,067 ft.

East Centerville, White County: Skelly & McBride 1 Bryant unit, SW SE 7-4s-10e, pumped 519 bbl., natural, Tar Springs 2,452 ft., T.D. 2,528 ft.

East Inman, Gallatin County: Carter 1 Carrie Jordan, NE NE NE 21-8s-10e, pumped 96 bbl. oil and 3 bbl. water, 20-qt. shot 2,400-15 ft., Weiler 2,384-89 ft., 2,402-16 ft., T.D. 2,421 ft.

Fairfield, Wayne County: Pure 1 C. E. Bonham, NW SE 1-2s-7e, dry at 3,360 ft., Glen Dean 2,758 ft., Barlow 2,938 ft., Cypress 2,951 ft., Aux Vases 3,247 ft., Ste. Genevieve 3,297 ft., McClosky 3,350 ft.

Goldengate, Wayne County: Jack Chevigney 1 Boze-Baker, W½ SW SW 29-2s-9e, pumped 15 bbl. oil and 15 bbl. water, 30-qt. shot 3,238-58 ft., 140-qt. shot 3,242-52 ft., T.D. 3,376 ft., P.B. 3,260 ft.

New Harmony, White County: Sun 2-B C. W. Ford, SW NW NE 21-4s-10e, pumped 155 bbl., 90-qt. shot 2,838-59 ft., Aux Vases sand 2,834 ft., saturation 2,838-58 ft., T.D. 2,868 ft.

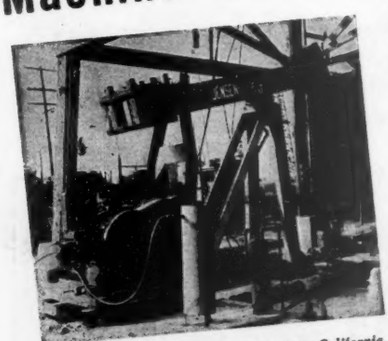
Sun 1 Henning, SW NW 33-4s-14w, gas input well, Cypress 2,570 ft., Benoist 2,677-84 ft., T.D. 2,699 ft.

Parkersburg, Edwards County: Magnolia 2 K. O. Koertge, N½ NW NW 5-1n-14w, dry at 3,333 ft., Glen Dean 2,538 ft., Hardinsburg 2,560 ft., Golconda 2,645 ft., Barlow 2,727 ft., Cypress 2,735 ft., Ste. Genevieve 3,087 ft., McClosky 3,134 ft.

Roland, White County: Kiowa Drlg. et al 2 Ledbetter,

(Continued on Page 82)

If JENSEN JACKS were Machine Guns



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Posey County Tests Are Nearing Pay Horizons

EVANSVILLE, Ind.—Surface casing has been set at Illind Oil Co.'s 1 Hendricks, Community, SE NE 31-6s-11w, Vanderburg County, in the area where Sells Petroleum Co. completed a discovery well a few months ago. Another test in the area, G. E. Nelson and United Petroleum Co.'s 1 P. Stader, NE SE NW 32-6s-11w, being drilled with cable tools, should be in the Waltersburg soon. This test is drilling below 1,700 ft. The Waltersburg, the sand from which the discovery well is producing, is found at about 1,780 ft. in the area.

Gulf Refining Co.'s 1 Lynn Strack, wildcat near Farmersville in Posey County, NE NE 30-6s-13w, is drilling plug following a squeeze job set to shut out water. The well will test saturation in the Cypress sand at 2,522 ft. It was plugged back from the St. Louis lime at a total depth of 3,028 ft.

Meanwhile, casing has been set at another Posey County test, Lindas 1 Ruby Spencer, SW SW 13-7s-13w, to test Tar Springs saturation. Eight feet of broken pay was recovered in one core and about 2½ ft. of saturation was found in a second core. The test originally was abandoned in the Mansfield sand but recently was deepened to the Tar Springs.

INDIANA COMPLETIONS

Daviess County: J. W. Cannon 1 Hunter, SE NW SE 6-2n-5w, dry, T.D. 879 ft., McClosky 816 ft.
Gibson County: Thomas & Kirchner 2 Kennedy, NW NE SW 35-2s-9w, pumped 20 bbl., sand 1,118 ft.
M. T. Schiek 1 Mason, NE SE 35-2s-9w, dry, T.D. 1,550 ft., Cypress 1,492 ft.
Knox County: J. E. Bauer 1 Ritler, NW SW 35-3n-10w, dry, T.D. 1,922 ft., Ste. Genevieve 1,813 ft., St. Louis 1,845 ft.
Spencer County: H. Vickers 1 Freshley, SW SE SE 28-6s-5w, dry, T.D. 1,006 ft.
H. & S. Drlg. 1-A Ellis, SE NW 7-7s-7w, dry, T.D. 1,062 ft., Waltersburg 1,011 ft.
P. Sacks 1 Huffman, NW SE 11-7s-7w, dry, T.D. 1,562 ft.
Warrick County: Frank Forrest 1 Walter, SW SW SE 35-4s-6w, abandoned location.

OHIO

ZANESVILLE, Ohio. — Ohio completions were scattered and small; only three gas wells gaged better than a million cubic feet open flow. Two wildcat tests in Lorain County found the Clinton sand dry. Clinton test in the Clayton pool, Perry County, is disappointing, making only 5 bbl. after shot.

OHIO COMPLETIONS

Ashland County, Lake Township: Frank Lyons et al 1 Howard Young, Sec. 16, 400,000 cu. ft. gas, shot, Clinton, T.D. 2,920 ft.
Vermillion Township: Stewart et al 1 Ray Helbert, Sec. 17, dry, Clinton sand absent, T.D. 2,833 ft.
Athens County, Carthage Township: Ohio Fuel 1 William H. Shea, Sec. 34, dry, Berea, T.D. 1,706 ft.
Trimble Township: Preston Oil Co. 1833 Sunday Creek Coal Co., SW Sec. 35, dry, Clinton sand, T.D. 3,575 ft.
Coshocton County, Perry Township: Mauller & Patten 2 Nellie Ryan, Sec. 24, dry, Clinton 3,148-3,200 ft., T.D. 3,210 ft.
Lorain County, Rochester Township: Ringler Co. 1 John Scott, Lot 7, dry, Clinton 2,332-39 ft., T.D. 2,438 ft.
Pittsfield Township: Ohio Fuel 1 E. Van Sickle, Lot 100, dry, Clinton 2,240-42 ft., T.D. 2,312 ft.
Medina County, Hinckley Township: Belmont Quadrangle 1 Metropolitan Park Board, Lot 68, 200,000 cu. ft. gas, shot, Clinton, T.D. 3,467 ft.
William Dempsey 2 J. Chodera, Lot 32, 1,750,000 cu. ft. gas, shot, Clinton, T.D. 3,539 ft.
Meigs County, Rutland Township: Pearl Ash et al 3 A. D. McCormick, Sec. 16, 500,000 cu. ft. gas, Maxon, T.D. 845 ft.
Frank Utsinger 1 Bessie Kennedy, Sec. 36, dry, Maxon (water), T.D. 810 ft.
Ohio Fuel 1 Frank Gardner, Fraction 35, dry, Keener, T.D. 1,084 ft.
Morgan County, Marion Township: Bern O. & G. Co. 1 E. N. Williams, Lot 6, 1,250,000 cu. ft. gas, Salt sand, T.D. 866 ft.
Muskingum County, Muskingum Township: Ohio Fuel 1 Ray Gallary, Sec. 11, 300,000 cu. ft. gas, shot, Clinton 3,528-70 ft., T.D. 3,733 ft.
Noble County, Elk Township: R. L. Smithberger 6 Edward Kilzer, Sec. 21, 50,000 cu. ft. gas, Maxon and lime, T.D. 1,240 ft.
Seneca Township: S. E. Ruby et al, Sec. 27, 50,000 cu. ft. gas, Berea, T.D. 1,509 ft.
Perry County, Clayton Township: Pure Oil 2 J. W. Ford, Sec. 6, 6,450,000 cu. ft. gas, show oil, Clinton 3,203-48 ft., T.D. 3,250 ft.
Preston Oil 3 Margaret Shaw (125 acres), Sec. 8, 5 bbl., shot, Clinton 3,268-3,325 ft., T.D. 3,329 ft.
Preston Oil Co. 1 Jacob and Gertrude Keffer, NW Sec. 9, 112 bbl. and 50,000 cu. ft. gas, Clinton sand, T.D. 3,315 ft.
Thorn Township: B. G. Davis et al 1 S. B. Yost, NW Sec. 12, dry, through Clinton sand, T.D. 2,745 ft.
Washington County, Ludlow Township: Hall & Henning 3 H. E. Hall, Sec. 28, 150,000 cu. ft. gas, Injun and Berea, T.D. 2,109 ft.
Newport Township: Newport Oil 26 A. Adkins, Sec. 27, ½ bbl., shot, first Cow Run, T.D. 475 ft.
Wesley Township: Ohio Fuel 1 Ruth Bridgewater, Sec. 5, dry, Maxon (water), T.D. 1,509 ft.
Liberty Township: H. H. Myers et al 2 John Rheminschneider heirs, SW Sec. 7, 1½ bbl., Injun sand, T.D. 1,562 ft.

EASTERN KENTUCKY

ASHLAND, Ky.—Eastern Kentucky operations continued on the same general level this week although reports from some counties reveal that a few new locations have been made.

The gas production was increased by a combined open flow of 2,091,000 cu. ft. as the Kentucky West Virginia Gas Co. reported the completion of three wells as follows:

Floyd County: No. 5396 Jasper Johnson, Prater Creek, shale and Big lime, open flow 119,000 cu. ft.
No. 5393 Cyros Frasure, Mud Creek, 189,000 cu. ft., T.D. 1,500 ft.
Pike County: No. 675 J. A. Scott, Brushy Fork, 1,783,000 cu. ft., T.D. 2,860 ft.

West Central Texas

(Continued from Page 74)

swabbed from the Marble Falls formation at 3,940-50 ft. Testing continued at week's end. The well was drilled to 4,380 ft., then plugged back to 3,963 ft. and perforated with 34 shots in the Marble Falls section. Tubing was run for the swab test.

Deep Wildcat Starts in Callahan

First deep wildcat in southeastern Callahan County in several years was announced as A. S. Goodloe et al 1 Mrs. Eliza J Mitchell, Section 1, Alfred Clements Survey, 3 miles northeast of the Cottonwood community. It will go to 8,000 ft.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Brown County: Guyle Greynolds et al 2 F. M. Crownover, Sec. 26, B.B.B.&C. Sur., dry, T.D. 3,006 ft.
Callahan County: J. D. Kynaston et al 3 R. H. Seale, J. P. Collins Sur., dry, T.D. 1,264 ft.
A. H. Odell 2 J. A. Barr, A. Cherry Sur. 332, dry, T.D. 418 ft.
Hamilton County: B-D-K Oil 1 Grady Anderson, Edward Ball Sur. 2, P-2-575, dry, T.D. 703 ft.
Shackelford County: O. E. Schkade and Ray Pool 1 B. Martin, Sec. 40, B.A.L. Sur., dry, T.D. 1,033 ft.
Taylor County: J. C. Hunter 1 J. C. High, Sec. 8, L.A.L. Sur., junked, T.D. 4,690 ft.

Fields

Loving, Stephens County: Beacon Oil & Refining 3 J. S. Poer, Sec. 10, O.A.L. Sur., pumped 21 bbl. after acid, lime 3,509 ft., T.D. 3,536 ft.
Knight & Ewing 1 H. Compton, Sec. 12, O.A.L. Sur., flowed 7 bbl. oil and 1,000,000 cu. ft. gas, lime 3,515-48 ft., T.D. 3,578 ft., P.B. 3,548 ft.
Novice, Coleman County: States Oil 2 W. L. White-B, Sec. 21, Blk. 2, T.&N.O. Sur., flowed 265 bbl. in 20 hr. through ¾-in. tubing choke, est. 285 bbl., sand 3,540-94 ft., T.D. 3,595 ft.

Louisiana Gulf Coast

(Continued from Page 69)

flank of the Pine Prairie dome, Evangeline Parish, Texas Co. 2-B Le Danois Land & Stone Co. is being drilled deeper in search of deeper sands. This well has showed evidence of opening another producing area on the flank of the structure by logging oil and gas sand at 9,462-93 ft., tentatively identified as the Sparta sand. On the east flank of the structure and located as an offset to production, Pan American 1 Monsour, 37-3s-1w, is bottomed at 8,200 ft., and is temporarily shut down after failing to find the sand. This was due to a fault which was cut betmeen 8,030-50 ft. The well is expected to be plugged back and sidetracked.

On the north flank of the Anse La Butte dome, St. Martin Parish, Stanolind 1 Nickerson is bottomed at 9,112 ft., where a strong salt water flow was encountered. Open hole below the point of 7-in. casing was squeezed off with cement. This is the first deep test to be drilled in the area and it is reported that favorable shows have been logged, but details were not available.

Another producer was completed in the Westwego field, Jefferson Parish, as Titantic 2 Marrero Land & Improvement Co. flowed at the rate of 194 bbl. daily through a 7/64-in. choke from perforated casing opposite sand at 9,001-14 ft. The well is free of salt water and is one of the best producers yet completed on the structure. Additional development is planned by the company.

Test in Tickfaw Area Dry

An attempt to open production in the Tickfaw area, Livingston Parish, failed with the abandonment of Danciger 1 Dendenger, which was abandoned after a series of tests in the Marginulina formation recovered salt water at intervals from 6,600-7,200 ft. This is one of the few deep tests drilled in this parish and the showings logged are expected to lead to additional wildcatting in the parish.

Gulf 1 Louisiana Sulphur Mining Co., located on the south flank of the Edgerly field, Calcasieu Parish, has been abandoned at a depth of 9,856 ft. The well is credited with having logged strong gas pressures below 9,000 ft., and a protection string of casing was recently cemented below this depth. The well is located in 33-9s-11w, about ¾ mile from shallow production, and it is the second deep test to be drilled in the area by the company.

On the Belle Isle dome, St. Mary Parish, Sun 1 State-Belle Isle is drilling ahead below 11,800 ft. with no shows of oil or gas reported. This is the deepest test drilled around the flank of the structure on which one well is producing gas-distillate from a depth of approximately 9,800 ft.

Humble 3 Manufacturers, discovery well of a new and deeper sand in the Paradis field, St. Charles Parish, flowed at the rate of 435 bbl. of 35-gravity oil daily through a ¼-in. choke from perforated casing at 11,104-14 ft. The sand section was logged from 11,088-11,116 ft.

LOUISIANA GULF COAST DISTRICT

Fields

Gibson, Terrebonne Parish: Union Producing Co. 1-A Pelican, 4,840,000 cu. ft. gas, perf. casing 10,303-20 ft., 10,331-42 ft., T.D. 10,410 ft.
Paradis, St. Charles Parish: Humble 3 Manufacturers, 454 bbl., ¼-in. choke, perf. casing 11,104-14 ft., T.D. 11,240 ft.
Texas 28 L. L. & E. Paradis, 476 bbl., ¼-in. choke, perf. casing 10,397-10,414 ft., T.D. 10,424 ft.
Starks, Calcasieu Parish: W. T. Burton 6 Industrial Lumber Co., 231 bbl., 16/64-in. choke, perf. casing 3,850-3,914 ft., T.D. 3,963 ft.
Sweet Lake, Cameron Parish: Pure 1 Miami Corp., dry, T.D. 7,768 ft.
Tepetate, Acadia Parish: Vincent & Welch 1 Ardoin, dry, T.D. 9,448 ft.
Charenton, St. Mary Parish: George Frankos 1 Hine, 166 bbl., ¼-in. choke, perf. casing 5,914-26 ft., T.D. 5,978 ft.

ROCKY MOUNTAIN AREA

East Outpost in Wilson Creek Field Makes Good Producer

By T. R. INGRAM

DENVER, Colo.—The Texas Co., in its joint operation with the California Co. on Wilson Creek, Rio Blanco County, Colorado, have another good well in their 10 Unit, NE SE SW 26-3n-96w, which is not yet a completion, but is still testing. It is an outside well on the east side and midway between the discovery well and 8 Unit, the latter being the most northerly well drilled. It is bottomed at 7,198 ft. with the 7-in. at 7,191 ft. The casing was gun-perforated opposite the Morrison sand and in the last test reported it flowed 440 bbl. in 24 hours through ¾-in. choke.

A location for a third well on Pilot Butte, Fremont County, Wyoming, following the bringing in of the discovery last month, was released this week in British American 1 Suzanna-Enos, CWL NW NW 22-3n-1w, immediately to the south of the discovery. Contract was let to the Parker Drilling Co. This makes three wells under way, one each by Superior and British American and one joint operation. British American is this week moving its headquarters for this territory from Denver to Casper. H. A. Thompson is in charge.

Little Poose Creek, Colorado, Test Starting

A wildcat of more than ordinary interest will be drilled on the Little Poose Creek structure in western Colorado on the boundary between Rio Blanco and Routt counties by Rio Oil Co., Inc., on government land approximately in the NW NW 28-3n-88w. Bridge and road is now being constructed to move the rig and materials. The drilling of this test is much like digging old rubber out of the basement with which to make new tires. It was known in the old days when nobody believed oil could be produced in the Dakota, and the Wall Creek sands were the principal objectives. W. E. Rennie, who discovered the Moffat dome, thought otherwise, and persuaded the Texas Co. to drill to that horizon with history-making results. The surrounding country then was scouted for structures in the Dakota. Everett S. Shaw, who then was with the old Midwest Refining Co., and who has the Iles field to his credit, geologized Little Poose Creek and found it to be a good structure. The only trouble was that the Dakota was at the surface and could not contain oil, and the structure was passed by. Later on, when water was found in the Dakota at Iles, Shaw advocated deeper drilling with the result that the Morrison and Sundance sands are now the principal producing horizons in that region. Little Poose Creek was forgotten until Rennie began scanning some of the old maps. While the Dakota could not produce, the geology on that formation showed a perfect structure with the Morrison and Sundance closed on all sides. William L. Christiana, land man with the old Mutual Oil Co. before it became the Continental Oil Co., shared the enthusiasm of Rennie and Shaw. The geology was rechecked, the leases assembled and an agreement reached with the Rio Oil Co. interests to make the test. Stanley T. Wallbank, of Denver, is president and treasurer of the new company; C. R. Privett, vice president; and E. J. Ruff, secretary.

West Plains Wildcat Resuming Operations

The West Plains Oil Co. 1 Sheldon, SE NW SW 3-10n-55w, West Plains district, Logan County, Northeast Colorado, which has been shut down at 3,312 ft. for the past year, has resumed under a contract with W. T. Hill to carry it to 6,000 ft. with cable tools. It is an interesting wildcat considerably to the north and west of most of the test wells drilled in northeastern Colorado. It had a good show of gas in lime shells at 1,110-13 ft., and another in brown lime at 1,480-82 ft. At 3,290-3,310 ft. it had carbon dioxide gas. It is lowering the 8¼-in. to shut off this gas in the bottom of the Pierre before going into the Niobrara. At 3,002-04 ft. it had salt water in gray sand.

The General Petroleum Corp. 7-17-P, NW SW SW 17-34n-76w, a wildcat on South Cole Creek, is in its objective, the Shannon sand, but results have not been revealed. It had cored through that horizon at 4,918 ft., and will go a few feet deeper and then stop for an electrical survey of the hole.

The Big West Oil Co. is starting another test in the Midway district between the Cut Bank and Kevin-Sunburst fields in search of oil in 1 Drake, SW NW NW 32-35n-4w. Location is 1 mile northeast of 1 Vial, a completion last week in the Cut Bank sand for 7,600,000 cu. ft. a day. Its 1 Vial, in turn, was half a mile to the northwest of 1 Dahlquist, the discovery well. The operation is 10 miles west of Kevin. Shows of oil in the contact were found in both wells, but were not commercial. A wide variance in the character of the oil in the two wells indicates the presence of a fault and the new test was located in an attempt to avoid the gas and find oil.

Bowdoin Gas Field Unitized

The Bowdoin field in Phillips and Valley counties, Montana, through the approval of a unitization plan by the Department of the Interior, probably is the largest unitized gas field in the country, beng approximately 66 miles long and 62 miles wide at the widest point. The area coming within the unit is close to 150,000 acres. Production is found in the Bowdoin and Phillips sands at a total depth of 900 to 1,100 ft. There were 93 wells producing or shut in at the beginning of the year and production in 1941 was 2,334,854,000 cu. ft. Approximately 100,000 acres are considered proven. On account of its size, the unit has been divided into seven subdivisions. Plans for unitizing the area have been under consideration the past 5 years. The Fidelity Gas Co., subsidiary of the Montana-Dakota Utilities Co., has been named operator for the unit. The gas is marketed in a number of Montana communities and the Fort Peck government project. The surface rocks are of Upper Cretaceous age.

MONTANA COMPLETIONS

Bowdoin field, Phillips County: Montana-Dakota Utilities 661 Phoenix Mutual, NW NW 28-32n-32e, Bowdoin sand 760-820 ft., Phillips sand 920-90 ft., 5½-in. at 751 ft., 4½-in. liner perf. at 935-1,033 ft., 1,090,000 cu. ft., R.P. 225 lb., T.D. 1,033 ft.

Cut Bank field, Glacier County: J. D. McKenzie 1 Tribal-212, NW SW NW 29-32n-5w, no Sunburst sand, upper Cut Bank 2,731-96 ft., no lower Cut Bank, shot, 2,780-2,800 ft., swabbed 8 bbl. first 12 hr., T.D. 2,865 ft., P. B. to 2,800 ft.

Glacier Production 6 Lookhoff, NW SE 33-33n-5w,

(Continued on Page 82)

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Lindsborg and Smyres Pools Extended in Active Play

By CARL HOOT

INCREASED Kansas activities, noticed particularly 2 weeks ago, continued through last week with 10 wildcats and 24 field tests completed. An increase in the May allowable production, for which operators have petitioned for some time, may have played its part to encourage additional drilling.

The Lindsborg pool of McPherson County received two south extensions to the main body, and 1 mile south, Dickey Oil Co. 1 Rundberg, W½ NW NE 19-17-3w, was given a state rating of 891 bbl. of oil a day from Viola lime at 3,368 ft. Previously reported as an extension 1 Rundberg has been designated as the discovery well of the South Lindsborg pool.

Expansion of the Smyres pool in Rice County continues with two wells added last week. Shade & Berry 1 Maltson, SW SE 25-19-6w, pumped 260 bbl. from the Mississippi lime at 3,358 ft. It is an east offset to the northernmost well in the pool. Continental Oil Co. 2 Johnson, NE NE NW 36-19-6w, pumped 204 bbl. from Mississippi lime at 3,324-63 ft. Completion of this well filled the gap between the two northern wells in the pool. Development of the field so far has been north and south through the center of Sections 36 and 25 and there are now five wells on a straight line with an east offset on both the north and south ends.

Several offset or extension wells were reported for new pools. Great Lakes Carbon Corp. 1 Shutts, NW NW NE 35-30-15w, an east offset to the discovery and only well in the Sun City pool of Barber County flowed into pits after drilling 11 ft. into Lansing-Kansas City lime at 4,289 ft. The hole filled with oil and flowed by heads before being shut in for storage tanks and completion tests.

The Viola lime trend extending from Southwest Peace Creek to the Schweizer pool in Reno County continues to be the most active area in the state. Development of the Peace Creek, Hendrickson and Schweizer pools has been at a near-record rate. Expansion of the Schweizer pool on the northeast end has been slower than the Peace Creek pools. However, last week three wells were added, broadening it on the south and extending it ¼ mile east. Two wells were added to the Hendrickson field, one of which was a ¼-mile west extension.

KANSAS COMPLETIONS

Wildcats

Barber County: Pryor & Lockhart 1 Atkins, E½ SE SW 14-30-15w, dry, T.D. 4,707 ft., Fort Riley 2,240 ft., Florence 2,340 ft., Topeka 3,081 ft., Lansing 3,964 ft., Viola 4,500 ft., Simpson 4,590 ft., Arbuckle 4,670 ft.

Comanche County: Sinclair Prairie 1 Exchange Bank, SE SE SW 27-33-19w, dry, T.D. 6,525 ft., Kansas City 4,340 ft., Mississippi lime 5,280 ft., Simpson dolomite 6,357 ft., Simpson shale 6,384 ft., Simpson sand 6,438 ft., Arbuckle 6,462 ft.

Kingman County: Dickey Oil 1 Davis, S½ SW SW 27-27-6w, dry, T.D. 3,420 ft., Lansing 3,100 ft.

Marion County: George Bruce et al 1 Schmidt, SW SE NW 2-20-2, dry, T.D. 2,997 ft., Lansing 1,959 ft., base Kansas City 2,298 ft., Mississippi lime 2,533 ft., Viola 2,750 ft.

Phillips County, 3 mi. S of Dayton pool: Sinclair Sinclair 1 Dill, SW cor. 13-3-19w, dry, T.D. 3,890 ft., Topeka 3,015 ft., Lansing 3,232 ft., base Kansas City 3,495 ft., Arbuckle 3,634 ft., granite wash 3,870 ft., granite 3,889 ft.

Pratt County: Wakefield 1 Jones, NE NW NE 24-28-13w, dry, T.D. 4,698 ft., Fort Riley 2,160 ft., base Florence 2,295 ft., Topeka 3,288 ft., Lansing 3,841 ft., Mississippi 4,345 ft., Viola 4,483 ft., Simpson 4,550 ft., Arbuckle 4,666 ft.

Reno County, Southwest Peace Creek discovery: Simpson Oil 1 Souder, SW NE NE 32-23-10w, flowed 20 bbl. an hr., est. 1,106 bbl. per day, Viola 3,671-78, T.D. 3,740 ft.

Rush County: Lario Oil & Gas 1 Schwindt, N½ NE SW 15-17-17w, dry, T.D. 3,579 ft., Topeka 3,065 ft., Lansing 3,348 ft., base Kansas City 3,565 ft., Lamotte sand 3,569 ft., granite 3,571 ft.

Russell County: Sunray et al 1 Kansas Trust, NW cor. 7-13-14w, dry, T.D. 3,243 ft., Fort Riley 1,735 ft., Neva 2,060 ft., Topeka 2,677 ft., Lansing 2,960 ft., Arbuckle 3.228 ft.

Stafford County: Atlantic 1 Stimpert, NE NE NW 34-22-12w, dry, T.D. 3,791 ft., Topeka 2,890 ft., Lansing 3,296 ft., Viola 3,675 ft., Simpson 3,726 ft., Arbuckle 3,761 ft.

Fields

Beaumont, Greenwood County: K. T. Weideman 15-A Lewis, NW NW 36-27-8, pumped 35 bbl., Mississippi lime 2,428-47 ft.

Campbell, Rice County: Auto Ordinance Corp. 1 Hall, N½ SW SW 34-19-9w, 1,190 bbl., swabbed 60 bbl. in 2 hr., Arbuckle 3,210-22 ft.

Davidson, Russell County: Stanolind 1 Borrell, N½ NE NE 33-15-11w, dry, T.D. 3,245 ft.

Dunbar, Cowley County: Frank Phelps 1-B Asmussen, NE NE NW 29-30-5, dry, T.D. 2,950 ft.

El Dorado, Butler County: Cities Service 214 Wilson, NE SE SW 8-25-5, pumped 45 bbl., Kansas City 1,966-2,024 ft.

Holcomb gas, Kearny County: Fin-Ker Oil & Gas 1 Tate, NW NW NE 22-25-35w, 7,210,000 cu. ft. gas, Herrington 2,455-2,680 ft.

Hugoton gas, Stevens County: Republic 1 Kuhn, NE NE SW 15-33-37w, 7,500,000 cu. ft. gas, Herrington 2.550-2,600 ft.

Kraft-Prusa, Barton County: Vickers Pet. 1-B Soeken, NW SW 22-17-11w, 3,000 bbl., swabbed 5½ bbl. an hr., Arbuckle 3,276-85 ft.

Broadview 1-B Baxter, S½ NW NW 2-9-16w, pumped 75 bbl., Lansing 3,155-58 ft., T.D. 3,207 ft.

Lindsborg, McPherson County: M. & L. Oil 1 Helberg, W½ NW NE 18-17-3w, pumped 608 bbl., Viola 3,351-67 ft.

Peace Creek, Reno County: Cities Service 1-E Krele, SW NE NW 28-23-10w, pumped 132 bbl., Viola 3,782-91 ft.

Ray, Phillips County: Cities Service 7-B Johnson, NE SE SW 32-5-20w, 903 bbl., Lamotte sand 3,567-77 ft.

Cities Service 3 Nichol, NE SW SW 33-5-20w, 1,341 bbl., Lamotte sand 3,575-83 ft.

Schweizer, Reno County: Cities Service 1 Ball, SW SW NE 31-22-9w, pumped 144 bbl. oil and 316 bbl. water, Viola 3,706-14 ft., T.D. 3,730 ft.

Cities Service 1-C Hoffman, NE SW 31-22-9w, pumped 134 bbl., Viola 3,709-17 ft., T.D. 3,720 ft.

Cities Service 2-C Hoffman, SW NW SW 31-22-9w, pumped 171 bbl., Viola 3,689-3,730 ft.

Silica, Rice County: Colorado Pet. 1 Roth, N½ NW SE 30-19-10w, dry, T.D. 3,330 ft.

Smyres, Rice County: Shade & Berry 1 Mattson, SW SE 25-19-6w, pumped 260 bbl., Mississippi lime 3,358-81 ft.

Continental 2 Johnson, NE NE NW 36-19-6w, pumped 204 bbl., Mississippi lime 3,324-63 ft., T.D. 3,376 ft.

Wherry, Rice County: Mid-Plains Oil 1-A Willis, S½ SE NW 11-21-7w, dry, T.D 3,411 ft.

Zenith, Stafford County: Phillips 7 Tretbar, E½ NW NE 12-24-11w, flowed 277 bbl. in 9 hr., Misener 3,701-06 ft., T.D. 3,735 ft.

Jefferson County: Hatcher & Fisk 1 Kell, NE SE 33-9s-20e, Bartlesville sand 1,394-1,430 ft., Mississippi lime, T.D. 1,430-48 ft., dry.

Hatcher & Fisk 1 T. Edmonds, SW SE 16-9s-20e, Bartlesville 1,388 ft., drilled plug to 1,399 ft., completed 5,000,000 cu. ft. gas.

Hatcher & Fisk 1 R. Kimmel, NW SW 30-9s-20e, Bartlesville 1,480 ft., T.D. 1,530 ft., dry.

NEBRASKA

ST. JOSEPH, Mo.—Skelly Oil Co., trying a second Viola lime test in the Dawson pool of Richardson County, Nebraska, was drilling at the close of the week at 2,862 ft. in 1 Smith, E½ SE SE 3-1n-14e. Coring of Hunton lime was started at 2,172 ft. Three cores were taken in the Hunton, the last being at 2,192-2,201 ft. The company's first Viola test, 1 Wiltse in E½ NW SE 10-1n-14e,

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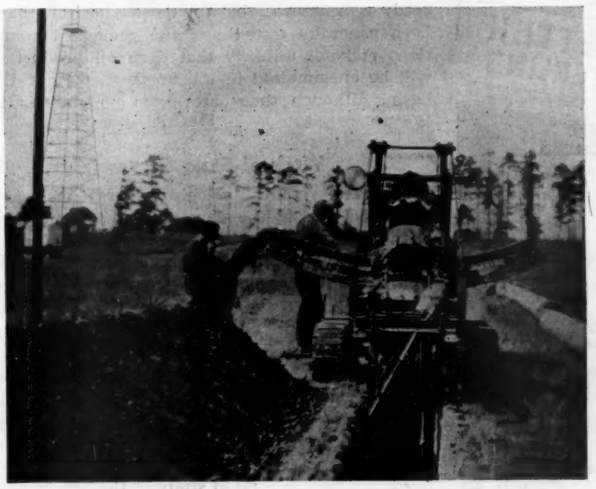

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is to be made into a Hunton producer if possible. Cement jobs failed to hold and the pipe was recemented.

Brown & Clampitt who are installing pump at 1 Cornelius in the Dawson pool, E½ SE NE 4-1n-14e, expects to produce about 100 bbl. of oil per day from the Hunton. Power Oil Co. still was waiting for pump to be installed at 1 Bohrer in E½ SW NW 10-1n-14e. This will be the first Viola lime well in Nebraska, if all goes well. Operators reported swabbing 360 bbl. per day. Lime was topped at 2,922 ft.

In Gage County, Nebraska, 3 miles east of Odell, Don Linn was drilling 1 Scheideler at 2,700 ft. in a 3,000-ft. test. Location is SW C 14-1n-6e.

Pennsylvania-Crude District Needs Further Development

(Continued from Page 68)

discovered, it is believed that the future of the industry depends principally on the wider application of new methods to old fields. Small extensions to known fields are frequently discovered. The Music Mountain field near Bradford with an area of 700 acres and a recoverable reserve of 3,700,000 bbl. was discovered in 1937. The Clayton-Perry pool in Ohio was discovered in 1936 and is not yet fully developed, but is estimated to embrace 2,000 acres and to contain a reserve in excess of 3,000,000 bbl. of oil. The accumulation of the oil is almost exclusively in stratigraphic traps, and prospecting is expensive and difficult. The Pennsylvania Geological Survey has been assisting such prospecting by the compilation of sand maps. Many thousands of wells have been drilled in all parts of the area, and for the most of these all records have been lost.

A few years ago geologists and scouts of some western companies became interested in the possibilities of deeper production in the eastern fields, largely disregarding the known pools. They spent a considerable sum of money in geological and geophysical work and drilled several wells, and only succeeded in confirming what was already well known; that the deeper horizons have been generally tested and the geological conditions make it unlikely that deep oil production will be encountered in the northern part of the basin, although there are some possibilities in West Virginia.

Work of State Surveys

The Pennsylvania Geological Survey has taken an active part in the development of the petroleum industry in Pennsylvania since 1870. During the first part of this century geological studies were made and reports published on the southern part of the state's oil regions, partly in cooperation with the U. S. Geological Survey. During recent years it became apparent that more detailed studies from a more modern viewpoint were required. This program is still in progress, but several reports with very detailed geological and engineering data have been published on the northern fields. At the present time the survey is engaged in a rapid study of the less known fields in order to estimate their potentialities for secondary recovery. The survey has in its main office at Harrisburg and its field office at Pleasantville a vast amount of data, including many maps and thousands of well records. It is one of the principal functions of that organization to assist in directing the expenditure of labor and capital in the exploitation of the state's mineral resources into the most productive channels. Dr. George H. Ashley, state geologist, under William S. Livengood, Jr., secretary of the Department of Internal Affairs, and the survey staff are, therefore, always glad to answer any inquiry to the best of their ability, either by letter or in person.

The West Virginia Geological Survey, located at Morgantown, W. Va., also has a large fund of information and has published numerous reports on the oil fields of West Virginia. Its staff is also glad to provide helpful information. The New York Geological Survey at Albany has published little on oil and gas in recent years, but some staff members are actively interested and can provide much information. The same is true of the Ohio Geological Survey at Columbus.

The Pennsylvania Grade Crude Oil Association, at Oil City, Pa., has done much to foster the oil industry of the region. Besides a campaign of advertising which has increased the demand for the premium quality lubricants made from this crude oil, it initiated and has supported a program of laboratory research on refining and production technique at the Pennsylvania State College. The U. S. Bureau of Mines has recently established an experiment station at Franklin, Pa. Engineers employed by these organizations may be called upon for information and advice.

Oklahoma Fields

(Continued from Page 77)

Potterf 4 Unglesbee, NE NW 16-16-7, pumped 10 bbl., Layton 1,483-1,508 ft.

Okfuskee County: Winona 1 Fier, SE NE SW 16-10-11, pumped 20 bbl., sand 3,025-38 ft.

Osage County: Finance Oil Co. 33, SE NW NW 30-23-9, dry, T.D. 2,249 ft.

F. A. Haver 8, SE NW SE 28-23-11, dry, T.D. 960 ft., *water disposal.*

Pawnee County: Sinclair Prairie 39 Jones, S½ NW 20-21-8, pumped 130 bbl., Bartlesville 2,267-2,350 ft.

Recompletions

Creek County: Sinclair Prairie 23 Berryhill, NW NW SE 16-17-12, pumped 1 bbl., T.D. 1,582 ft., old T.D. 1,564 ft.

Sinclair Prairie 1 Wolfe, SE SW NE 18-14-10, pumped 10 bbl., T.D. 3,421 ft., P.B. 3,396 ft.

Kay County: Flossman 1 School Land, NW NW 16-27-1w, dry, T.D. 3,637 ft., P.B. 3,464 ft.

Kiowa County: H. J. Sherman 2-A Watkins, NW SW [illegible] 7-17w, dry, T.D. 1,342 ft., old T.D. 1,138 ft.

Noble County: Sunray 2 Guthrie, SW NE SW 31-21-2w, pumped 100 bbl., T.D. 5,486 ft., old T.D. 5,462 ft.

Oklahoma County: British American 1 Francis, SW SE SW 22-12-3w, dry, T.D. 6,548 ft., old T.D. 6,522 ft.

Pottawatomie County: Sinclair Prairie 3 Deatherage, SE NE NW 28-7-4, pumped 45 bbl., T.D. 4,321 ft., P.B. 4,149 ft.

Rocky Mountain Area

(Continued from Page 80)

7-in. 2,883 ft., Sunburst 2,782-2,834 ft., show oil 2,823-24 ft., Cut Bank 2,870-99 ft., main pay 2,833-99 ft., swabbed 412 bbl., T.D. 2,901 ft.

Texas Co. 2 Sherburne, NE NW 10-34n-6w, 7-in. 2,908 ft., Sunburst 2,835-60 ft., dry, Cut Bank 2,873-2,955 ft., main pay streaks at 2,941-43 ft., 2,945-47 ft., 400 ft. fluid in hole, swabbed 22 bbl, shot and swabbed 15 bbl. in 8 hr., T.D. 2,980 ft.

Kevin-Sunburst field, Toole County: A. M. Crumley & Son 23 Fryberger, CWL NW SE 24-35n-3w, contact 1,576-1,695 ft., acid, averaged 25 bbl. a day on 10-day test, T.D. 1,605 ft.

Illinois Fields

(Continued from Page 78)

NE NE NE 14-7s-8e, dry, old well P.B. 2,904-2,267 ft., formerly a producer.

Rural Hill, Hamilton County: Shell 1 Hungate, NE NW SW 24-6s-5e, flowed 397 bbl., perf., 3,296-3,324 ft., Aux Vases 3,072 ft., pay 3,076-3,114 ft., T.D. 3,332 ft.

Shell 1-A B. W. Hatcher, SW SE SE 11-6s-5e, dry at 3,440 ft., Glen Dean 2,604 ft., Hardinsburg 2,656 ft., Golconda 2,744 ft., Cypress 2,910 ft., Benoist 3,064 ft., Aux Vases 3,185 ft., Ste. Genevieve 3,222 ft., McClosky 3,320 ft.

Sims, Wayne County: Texas 1 N. J. Jordan, N½ SE NE 32-1s-6e, dry at 3,182 ft., Glen Dean 2,538 ft., Golconda 2,691 ft., Barlow 2,745 ft., Weller 2,785 ft., Paint Creek 2,882 ft., Renault 3,022 ft., Aux Vases 3,034 ft., Ste. Genevieve 3,086 ft., McClosky 3,172 ft.

Texas 1 A. L. Harlan, W½ SW SW 22-1s-6e, pumped 287 bbl. oil and 148 bbl. water, 2,000 gal. acid, reacidized 4,000 gal., perf. 3,136-42 ft., 1,000 gal. acid, McClosky 3,190-95 ft., T.D. 3,205 ft.

Walpole, Hamilton County: Texas 1 S. L. Johns, W½ NE SE 34-6s-6e, pumped 70 bbl., 5-qt. shot 3,129-34 ft., Aux Vases 3,104 ft., pay 3,123-31 ft., T.D. 3,134 ft.

Woodlawn, Jefferson County: Skelly 2 Woodlawn Bank, NW SW SW 1-3s-1e, pumped 111 bbl., 20-qt. shot 1,905-54 ft., Benoist 1,946 ft., T.D. 1,954 ft.

MICHIGAN OPERATIONS

Small Producers Completed In Roscommon County

By OTTO C. PRESSPRICH

SAGINAW, Mich.—Roscommon County's Richfield Township production was increased last week as Sun Oil Co. 2 St. Helen Resort was completed for 32 bbl. a day. Another was on test, the Ohio Oil Co. D-1 State showing 1,500 ft. of oil in the hole. The Sun A-2 State in Roscommon Township also was completed for 32 bbl. a day.

Another setback developed in the Richfield section of Missaukee County as Pure Oil Co. 1 Whittet was completed dry. It was an offset to the Turner Petroleum Co. 1 Cavanagh wildcat which came in about 2 months ago.

A total of 16 completions was recorded last week in Michigan oil and gas fields. Eleven of the completions were oil wells with production ranging from 5 to 197 bbl. a day for a total initial potential of 603 bbl. daily. Three tests were dry holes and the two other completions were big gas wells developed by Taggart Brothers Co. in the Winfield-Montcalm gas pool. Together they gaged more than 25,000,000 cu. ft. a day. Best of the week's new oil wells was Sun Oil Co. Evangelical Church test in Beaverton-Gladwin. It was rated good for 197 bbl. Three of the completions were in the Reed City field, but all were small wells.

A recent statistical compilation shows the Reed City field, now in its second year, has produced 6,000,000 bbl. of oil with 165 producers drilled in the field.

Increased oil and gas production in Michigan in April was reflected in state severance tax figures. The April tax totaled $55,700, up $8,167, based on April production valued at $2,785,000.

The state Conservation Department issued five drilling permits last week, two for Clare County tests, one each for wells to be drilled in Mecosta, Kent, and Van Buren counties.

MICHIGAN COMPLETIONS

Allegan County, Hopkins Township: C. A. Perry-Cross & Gould 2 Nicolai, SW NE NE 18-3n-12w, pumping 65 bbl., acidized, T.D. 1,565 ft.

Trowbridge Township: John F. Burton 1 Dickinson, NE NE SW 31-1n-13w, pumping 50 bbl. and salt water, acidized, T.D. 1,332 ft.

Arenac County, Adams Township: Don Rayburn 3 Ostrosky, NW SE SE 22-19n-3e, dry, T.D. 3,022 ft.

Gladwin County, Beaverton Township: Sun Oil Co. 1 Evangelical Church, C E½ NE NW 35-17n-2w, flowing 197 bbl., acidized, T.D. 3,880 ft.

Lake County, Pinora Township: Ohio Oil Co. 1 Campbell, C S½ SW SE 24-18n-11w, pumping 50 bbl., natural, T.D. 2,978 ft.

Missaukee County, Riverside Township: Pure Oil Co. 1 Whittet, C N½ NW SW 14-21n-7w, dry, T.D. 3,978½ ft.

Montcalm County, Winfield Township: Taggart Bros. Co. 20 Schnick-Hayes et al, C NE 18-12n-9w, 13,100,000 cu. ft. gas, T.D. 1,119 ft.

Taggart Bros. Co. 21 Lovegran-Crimmins et al, C W½ Sec. 18, 12,000,000 cu. ft. gas, T.D. 1,122 ft.

Newaygo County, Big Prairie Township: Turner Petroleum Corp. 1 Swenson, C S½ SW SE 3-13n-11w, wildcat, dry, T.D. 3,410 ft.

Osceola County, Lincoln Township: McClanahan Oil Co. 1 Mann, C S½ NW NW 19-18n-10w, pumping 18 bbl. natural, with salt water, T.D. 3,662 ft.

C. L. Maguire, Inc., 1 Savidge, C N½ NE SE Sec. 29, flowing 110 bbl. natural, T.D. 3,551 ft.

Pure Oil Co. C-1 Richards, C S½ SW SW Sec. 17, pumping 24 bbl., acidized, T.D. 3,616 ft.

Ottawa County, Tallmadge Township: Oil Producers, Inc., 2 Cross, C E½ SE NE 15-7n-13w, pumping 20 bbl. and salt water, acidized, T.D. 1,886 ft.

Roscommon County, Richfield Township: Sun Oil Co. 2 St. Helen Resort Association, C N½ SE SW 21-24n-1w, flowing 32 bbl., acidized, T.D. 4,230 ft.

Roscommon Township: Sun Oil Co. A-2 State, C N½ NW SW 33-21n-32, flowing 32 bbl., acidized, T.D. 4,987 ft., P.B. to 4,970 ft.

Tuscola County, Wisner Township: C. Turbush and R. Duncan 1 Ruppert, NE NW SW 25-14n-7e, pumping 5 bbl., acidized, T.D. 2,858 ft.

Permian Basin, Panhandle

(Continued from Page 70)

through ¾-in. tubing choke after acid, pay 5,205 ft., T.D. 5,280 ft.

TEXAS PANHANDLE

AMARILLO, Tex.—The large nonproducing area surrounded by the Northern West Texas area, the Panhandle and the Wichita Falls district had two more dry wildcats last week. Humble 2 Matador, Dickens County, was abandoned at 6,314 ft. and Mid-Continent 1 S. B. Burnett, King County, was quit at 6,180 ft., having topped the Ellenburger at 6,135 ft.

TEXAS PANHANDLE COMPLETIONS

Carson County: Cities Service Gas 47 Burnett-A, Sec. 13, Blk. 4, I.&G.N. Sur., gaged 20,600,000 cu. ft. gas, R.P. 325 lb., T.D. 2,765 ft.

Gray County: Danciger Oil & Refining 25 Powell-Beck, Sec. 28, Blk. B-2, H.&G.N. Sur., potential 343 bbl., T.D. 2,943 ft.

Hutchinson County: J. M. Huber 1 Davad & Hanson, Sec. 1, Blk. M-16, A.B.&M. Sur., gaged 11,400,000 cu. ft. gas, R.P. 402 lb., T.D. 3,280 ft., P.B. 3,172 ft.

California Fields

(Continued from Page 73)

ber of years ago. The discovery well at Buena Park was only a small well and for this reason some are not entirely satisfied that Texas Co. has a new oil field at this location.

In the West Coyote field of Orange County, Standard Oil Co. is drilling ahead in 129 Murphy-Coyote below 9,100 ft. but has not reported finding any new productive zone. All present production in the West Coyote field comes from the Pliocene age and it is not yet certain whether 129 Murphy-Coyote is entirely through the Pliocene.

LOS ANGELES BASIN COMPLETIONS

Whittier wildcat district, Los Angeles County: R. S. Lytle 1 Central, 15-2s-11w, dry, T.D. 5,912 ft.

Wilmington, Los Angeles County: Royalty Service Corp. 21-5-1 Banning, 33-4s-13w, pumped 175 bbl., 15.1-gravity, 10 per cent cut, T.D. 3,550 ft., gravel packed perf. 2,530-2,900 ft., 3,140-3,550 ft., completed in Ranger zone.

Union Pacific Railroad Co. 77 fee, 34-4s-13w, pumped 60 bbl., 20.9-gravity, 0.4 per cent cut, T.D. 3,195 ft., perf. 2,914-3,036 ft., 3,078-3,190 ft., completed in Ranger zone.

BOOK REVIEW

SOURCE BEDS OF PETROLEUM, by Parker D. Trask and H. Whitman Patnode, American Association of Petroleum Geologists, Tulsa, Okla. 566 pp. Price $4.50.

"Source Beds of Petroleum" is a report of an investigation supported jointly by the American Petroleum Institute and the U. S. Geological Survey for the past 10 years following the completion of an investigation of recent deposits as source materials by the senior author. Many thousands of samples have been analyzed and the results have been statistically analyzed for presentation in this report.

The writers conclude that the nitrogen-reduction ratio forms the best criterion of source beds, those with a low ratio being most closely associated with oil deposits.

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May Completions Hold Steady At Rate of 45 Daily

AFTER sinking to a low of 1,314 in March, completions appear to have levelled off at about 45 daily. May's completions totaled 1,421, a decrease of 28 from April's record. Oil wells numbered 846, an increase of 20, while gas wells were down 12 and dry holes 36. This suggests a decrease in the rate of wildcatting, the trend being still opposite to that which it was hoped would be established by M-68.

Compared with May 1941, completions have dropped from 2,669 wells to their present level. During that month, there were 1,879 oil wells, 236 gas wells and 554 dry holes. Last month's record indicates that wildcatting is still relatively near last year's level but that 40-acre spacing for oil wells and 160-acre spacing for gas wells has greatly curtailed development drilling.

Considering the different areas, there is no important change from the April figures except in Illinois and Kansas. There has been an increase of 36 completions in Illinois and a decline of 32 in Kansas. These figures, of course, indicate the trend of demand for oil in the two areas, with Illinois producing to capacity and Kansas allowables remaining at very low levels.

Few new fields have been developed this year. The Haynesville deep sand in northern Louisiana has seen active exploitation as well as the Midway field in Arkansas. In Oklahoma, Apache and Cumberland are the only important active fields. Drilling in Slaughter, West Texas' largest new field, has fallen off but activity in this area may be expected to be greatly increased by the great enlargement of the M-Bar field in Andrews County.

The effect of the new Paluxy discovery in East Texas and the Tuscaloosa find in East Central Louisiana should increase wildcatting, at least, in these sectors. Whether or not there is much development drilling will naturally depend on the results obtained by offsets. It is entirely possible that these new areas will be responsible, directly or indirectly, for 100 or more wells.

Outside of these areas, the rate of drilling will probably remain low. With 8,200 wells completed at the end of May and completions coming in at the rate of 1,400 to 1,450 a month, it is barely possible that Mr. Knowlton's estimate of 19,000 wells in 1942 will prove approximately correct. However, a still greater reduction in drilling is threatened next month when M-68 may be superseded by more rigid restrictions.

Southwest Texas

(Continued from Page 75)

Seaboard 5-B Welder, 138 bbl., ⅛-in. choke, perf. casing 5,317-19 ft., T.D. 5,810 ft.

Seeligson, Jim Wells County: Transwestern 10 Dunlap, temp. abd., T.D. 6,247 ft.

Stratton, Nueces County: Chicago Corp. 27 Wardner, 150 bbl., ⅛-in. choke, perf. casing 6,575-81 ft., T.D. 6,610 ft.

LAREDO DISTRICT

Fields

Colorado, Jim Hogg County: C. Andrade 1-J Trevino, 5 bbl. pumping, sand 2,822-28 ft., T.D. 2,829 ft.

Humble 69-B King, 148 bbl., ¼-in. choke, sand 3,100-14 ft., T.D. 3,116 ft.

Driscoll, Duval County: Continental 79-A Driscoll, 201 bbl., ¼-in. choke, perf. casing 3,375-85 ft., T.D. 3,386 ft.

Oakville, Live Oak County: H. Coquat 1 Reagan, 28 bbl. gas lift, perf. casing 1,919-21 ft., T.D. 1,922 ft.

Oilton, Webb County: W. H. Holland 1 Neal, dry, T.D. 2,073 ft.

Rincon, Starr County: Continental 73-A Slick, 164 bbl., ⅛-in. choke, sand 4,097-4,105 ft., T.D. 4,238 ft.

Humble 1 San Antonio Loan & Trust Co., 86 bbl., ⅛-in. choke, sand 3,784-91 ft., T.D. 3,791 ft.

South Rincon, Starr County: Sun 2-A Frost National Bank, 32 bbl., pumping, perf. casing 4,181-83 ft., 4,187-91 ft., T.D. 5,435 ft.

Sun, Starr County: Humble 12 Montalvo, dry, T.D. 4,644 ft.

SOUTH CENTRAL TEXAS

Fields

Dale, Caldwell County: R. R. Ogden 16 Talley, 99 bbl. pumping, top pay 2,199 ft., T.D. 2,280 ft.

NORTH LOUISIANA, ARKANSAS

Smackover Found Low in Midway West Outpost

SHREVEPORT, La.—Barnsdall Oil Co. 1 Spencer-Gunter, SW SE 5-15s-24w, a 2-mile northwest outpost from the Midway field of Lafayette County, Arkansas, was completed dry last week. The well, which ran low, was drilled to total depth of 6,560 ft., 5 ft. in Smackover lime topped at —6,280 ft. Elevation is 275 ft. Completions have been slow in the field for several weeks but a number of wells are drilling and several new wells are getting under way. Barnsdall announced the following first reports: No. 6 Roberts, a north offset to 4 Roberts in Section 11; 2 McClaine in Section 13, which may extend the field ¼ mile southeast; and the 3 Dobson which may broaden the field at the northwest end. Southwood Oil Co. 1 Hodnett, SW NW 18-15s-24w, approximately 1-mile southeast outpost was last reported drilling at 4,700 ft.

Nine completions in the Haynesville field with a total initial production of 4,604 bbl. brought the number of producers to 53. For several weeks the area has been the most active in North Louisiana.

NORTH LOUISIANA COMPLETIONS

Wildcats

Concordia Parish: H. L. Hunt 1 Learned, SE SW SW 18-8-10e, dry, T.D. 6,933 ft., Vicksburg 1,100 ft., Cockfield 1,648 ft., Sparta 2,455 ft., no Cane River, Wilcox 3,732 ft., Midway 6,850 ft.

Natchitoches Parish: George H. Echols et al 1 Goodpine, NE NE 13-13-8w, dry, T.D. 6,552 ft., perf. 4,946-74 ft., 4,900-10 ft., flowed salt water on D.S. test.

Union Parish, 8 mi. W. Monroe gas area: Ward Delaney et al 1 Taylor, SW NE 12-19-1e, dry, T.D. 5,104 ft., Wilcox 1,095 ft., Midway 1,542 ft., Chalk 2,285 ft., Massive Anhydrite 3,232 ft., James 4,058, Sligo 4,362 ft., Travis Peak 4,605.

Fields

Bellevue, Bossier Parish: T. G. Shaw 1-A Hendricks, E½ SE SW 22-19-11w, dry, T.D. 2,006 ft., old well drilled deeper.

Haynesville, Claiborne Parish: Ohio Oil Co. 1 Garrett P-5, SW NW 24-23n-8w, flowed 32 bbl. through choke, T.D. 5,365 ft.

Ohio 1 Parker-Hilburn, 22-23-8, flowed 1,278 bbl., T.D. 5,315 ft.

Ohio 1 Sherman P-4, 10-23-8, flowed 721 bbl., T.D. 5,416 ft.

Ohio 1 Taylor P-3, 14-23-8, flowed 1,055 bbl., T.D. 5.300 ft.

Arkansas Fuel Oil 1 Waller-Taylor, 14-23-8, flowed 32 bbl. an hr., T.D. 5,351 ft.

Gulf 1-A Seegars, N½ NW NW 11-23-8w, flowed 532 bbl. in 15 hr., T.D. 5,390 ft.

Robert A. Stacy 1 Hunt, 16-23-8, flowed 79 bbl. in 3 hr., T.D. 5,400 ft.

White & Hughes 1 Lowe, 16-23-8, flowed 300 bbl. in 16 hr., T.D. 5,494 ft.

Mid-States Oil Corp. 1 Parker, flowed 575 bbl. in 12 hr., T.D. 5,348 ft.

Nebo, La Salle Parish: Placid Oil 1 Hailey, NE SE 3-7-3, flowed 324 bbl. through choke, Wilcox 2,493 ft., T.D. 3,528 ft.

South Olla, La Salle Parish: Placid Oil 12-B Goodpine, SW SW 26-9-2, dry, T.D. 2,900 ft.

Sugar Creek, Claiborne Parish: J. B. White 1 Byrd, NW NE 18-19-5w, 52,000,000 cu. ft. gas, sand 5,874-94 ft., T.D. 6,002 ft.

ARKANSAS COMPLETIONS

Dorcheat, Columbia County: R. A. Stacy et al 1 Barton, SW SE 11-18-22w, flowed 10 bbl. an hr. through choke, 44 gravity, Smackover 8,882 ft., T.D. 8,960 ft.

Macedonia, Columbia County: Magnolia 1 Willis, CN½ SE 17-18-21w, flowed 273 bbl. distillate, Smackover 8,885 ft., T.D. 8,935 ft.

Midway, Lafayette County: Barnsdall 1 Spencer-Gunter, SW SE 5-15s-24w, dry, T.D. 6,560 ft., Buckner —6,061 ft., Smackover —6,280 ft.

First Reports

Midway, Lafayette County: Barnsdall 6 Roberts, NE SE 11-15s-24w, drilling below 2,290 ft.

Barnsdall 3 Dobson, NE NE 10-15s-24w, drilling below 2,430 ft.

Barnsdall 2 McClaine, NE NW 13-15s-24w, drilling below 1,545 ft.

SUMMARY OF OPERATIONS, ALL FIELDS, MAY

	Comp.	Oil	Prod.	Gas	Completions: Dry	Under 1,000 ft.	1,000-2,500 ft.	2,500-5,000 ft.	5,000-10,000 ft.	Over 10,000 ft.	Footage	Drlg.
Appalachian	287	201	512	63	23	7	232	28	20	0	588,325	302
Ohio	88	25	993	42	21	22	28	38	0	0	205,667	194
Indiana	21	8	476	2	11	2	12	7	0	0	42,620	44
Kentucky	12	1	10	9	2	0	8	4	0	0	26,596	64
Michigan	56	26	32,796	6	24	0	29	27	0	0	140,136	125
Illinois	136	74	13,566	2	60	9	20	107	0	0	369,489	226
Kansas	99	50	48,559	7	42	0	20	78	1	0	299,499	172
Nebraska	1	0	0	0	1	0	1	0	0	0	1,323	10
Missouri, Iowa	2	0	0	0	2	2	0	0	0	0	1,198	0
Oklahoma	88	42	11,442	4	42	4	24	49	11	0	287,840	190
North Texas	64	26	11,698	1	37	9	16	28	11	0	220,072	72
West Central Texas	34	14	1,003	5	15	4	12	18	0	0	86,687	37
Northern West Texas	68	65	6,234	0	3	0	0	18	50	0	338,397	83
Southern West Texas	65	47	41,165	2	16	3	16	35	10	1	241,015	98
Texas Panhandle	31	29	5,119	0	2	0	3	26	2	0	93,524	35
East Texas	31	19	2,769	1	11	0	1	27	3	0	134,282	28
Upper Gulf Coast	66	52	9,721	2	12	0	0	9	54	3	450,300	76
Lower Gulf Coast	35	23	2,555	0	12	0	0	1	34	0	220,500	44
South Central Texas	5	0	0	0	5	2	3	0	0	0	10,860	10
South Texas	35	15	1,625	0	20	0	3	28	4	0	117,985	30
Southeast New Mexico	29	23	4,677	0	6	1	0	28	0	0	95,444	65
Arkansas	10	5	707	0	5	0	0	4	6	0	60,276	28
North Louisiana	28	23	9,060	0	5	1	3	5	19	0	126,552	61
Louisiana Gulf	40	24	6,601	0	16	0	1	1	13	25	358,430	78
Mississippi	3	0	0	0	3	0	1	1	1	0	13,918	4
Alabama	0	0	0	0	0	0	0	0	0	0	0	5
Montana	18	15	1,519	2	1	0	8	10	0	0	44,201	62
Wyoming	12	10	3,336	0	2	1	1	6	4	0	52,133	61
Colorado, Utah	0	0	0	0	0	0	0	0	0	0	0	31
Northwest New Mexico	3	2	49	1	0	0	0	2	1	0	5,789	13
California	54	27	12,041	1	26	12	11	11	18	2	209,742	87
Florida	0	0	0	0	0	0	0	0	0	0	0	3
Total May	1,421	846	228,233	150	425	82	453	596	262	31	4,843,100	2,339
Total April	1,449	826	268,973	162	461	70	466	566	310	37	5,196,230	2,270
Difference	28	20	40,340	12	36	12	13	30	48	6	353,120	69

East Turner Valley Outpost May Extend Field

By VICTOR LAURISTON

CHATHAM, Ont., June 13.—Crude and natural gasoline production from all Alberta fields in April totaled 832,261 bbl., or 27,742 bbl. daily, a decrease of 1,564 bbl. per day from March, but an increase of 846 bbl. per day over April 1941.

Crude and natural-gasoline production from all Alberta fields for the week ending June 1 averaged 28,573 bbl. daily, compared with 28,593 bbl. daily for the previous week.

TURNEY VALLEY COMPLETIONS

West Central section: Southwest Petroleum 7, LSD 13, 8-19-2w5, T.D. 6,940 ft., Madison at 6,480 ft., initial production 330 bbl. daily of 45.6-gravity crude with 990,000 cu. ft. of gas.

East Test Looks Good

Major Oils 9, LSD 1, 4-21-3w5, most easterly test in the North Turner Valley extension, looks like a large producer after encountering somewhat unsual lime conditions. The well got the Madison around 7,640 ft. and is below 8,476 ft. Upper porous zone was 99 ft. and at last reports the drill was more than 90 ft. in the lower porous, with two intermediate zones of 4.1 and 14 ft., which are not usually encountered. The lime already drilled is nearly twice the normal depth. Location is apparently east of the crest of the structure, offsetting Foothills 10 to the east, and a successful completion will prove an easterly strip of indeterminate width extending from 4 to 5 miles to the northwest.

North Extension Tests

With some nine tests in the North Turney Valley extension shutdown, conferences are being held between operators in that area and representatives of the federal and provincial governments with a view to cooperating in the systematic testing of the area. The most northerly producer is now Atlas-British Dominion 2, LSD 4, 17-21-3w5, finished at 8,710 ft. Since then, Ace Royalties 2, LSD 10, 22-22-4w5, was abandoned in the lower Benton at 8,244 ft. The latter was about 7½ miles north and 3¼ miles west of the Atlas-British Dominion producer. Present plans contemplate the testing of the intervening area by the cooperative completion of four wells. These are Major Oils 12, LSD 4, 36-21-3w5, now in the upper Blairmore below 8,200 ft.; Hastings Royalties 1, LSD 3, 30-21-3w5, in the lower Benton below 7,353 ft.; Bonaventure Royalties 1, LSD 16, 24-21-4w5, in the lower Benton below 6,365 ft. after faulting back from the upper Blairmore; and Northend Petroleum 3, LSD 4, 20-21-3w5, in the Blairmore below 7,202 ft. All these tests have a chance of getting the lime at practicable depth, and have been recommended for completion by Dr. G. S. Hume, geological adviser to the federal oil controller. The Alberta Government will likely remit royalties as an aid to the operators, and tax concessions have been suggested.

North of these tests, Inland-Sarcee 1, LSD 2, 4-23-4w5, is in the lower Benton below 6,884 ft., and will be carried to 10,000 ft. if this depth is necessary to test the Madison limestone. This is at present the most northerly active test in the field being approximately 10 miles north and 3½ miles west of Atlas-British Dominion 2, the most northerly producer.

Other Alberta Tests

In the Clearwater-Ram River area, in the foothills northwest of Calgary, Ram River Oils 2, 1-37-11w5, in the Denvonian limestone below 4,140 ft., shows some porosity, and is deepening.

In the Monitor district, eastern Alberta, McColl-Frontenac 3, LSD 16, 18-29-5w4, finished a dry hole at 2,925 ft., and has been plugged and abandoned. This is the company's third unsuccessful test in the Monitor area.

In the Wainwright field, east-central Alberta, Wainwright Development 1, LSD 8, 17-45-6w4, drilled to 2,287 ft. and plugged back to 2,200 ft., has a daily production of 15 bbl. of 17-gravity water-free crude from the upper sand.

In the Tilley field, eastern Alberta, Northwest Co. 2, LSD 4, 17-17-22w4, finished around 3,180 ft., is officially credited with initial production of 80 bbl. daily of 24-gravity crude, with 120,000 cu. ft. of gas. Production has since declined and has shown an increasing water content.

Twin River Operations

In the Twin River area, southern Alberta, Paragon Oils, headed by Frank E. Ruben, is rigging derrick at the old Nordon-Roney well, which will be cleaned out and deepened to restore production. Twin River 3, in the lime around 3,650 ft., is continuing production tests. After the Nordon-Roney is deepened, both wells will be acidized.

Northern Development Planned

Steps looking to the development of the Peace River block in northern British Columbia and the adjacent Pouce Coupe structure in northern Alberta are being taken by the federal and provincial governments. Construction of a 20-mile gap in the highway between Grande Prairie and Pouce Coupe has been undertaken by the Alberta Government to facilitate the moving of drilling equipment to the potential field some 20 miles northwest of Dawson Creek. The federal government has transferred some of its geological field parties from southern Alberta to the northern field.

Vermilion Field

In the Vermilion field, eastern Alberta, Northwest Co. 1 Claysmore, LSD 4, 34-50-8w4, has spudded and is below 460 ft. with surface casing set. Location is west of the proven field. Vermilion Consolidated 9 (formerly Hamers 4) has been got under control and is on the pump. It looks like a large producer. Vermilion Consolidated 8 (Hamers 3) is producing under its own gas pressure. Alberta Southern 1, LSD 15, 20-50-5w4, finished around 1,800 ft., is in production. Shipments of conditioned oil from the Vermilion processing plant have been used as drilling and refinery fuel and some 6,000 bbl. are in storage. Richardson 1 producer is shipping its output under contract to Lloydminster, and other wells are shipping to North Battleford and Winnipeg.

Tar Sands Report

The committee which recently investigated the feasibility of recovering petroleum on a large scale from the bituminous sand deposits of northern Alberta has submitted its report to the federal government. Pending study of the report by Hon. C. D. Howe, minister of munitions and supply, the contents have not been made public.

Fort Norman Pipe Line

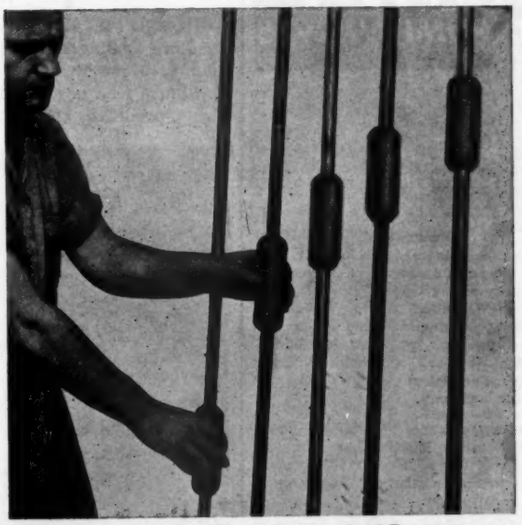
Pipe sufficient to lay between 700 and 800 miles of line, with casing for new wells, is being moved north from Alberta to the Fort Norman field. The shipment is being moved by rail from Edmonton to Waterways, and thence by river scows

(Continued on Page 91)

LEGAL

United States Department of the Interior, District Land Office, Evanston, Wyoming. Notice is hereby given that the oil and gas deposits in the NW¼ SE¼ Sec. 27, T. 27 N., R. 113 W., 6th P.M., La Barge field, Wyoming, are offered to the responsible qualified bidder of the highest bonus per acre for a lease under Section 17 of the amendatory leasing act of August 21, 1935 (49 Stat. 674) at the royalty rate scale in the lease form shown in Circular 1386 at a sale to be held in the district land office, Evanston, Wyoming, at 10:00 A.M. on July 14, 1942. The successful bidder must deposit with the Register on the date of sale a certified check on a solvent bank or cash for 1/5 of the amount bid and file the showing of qualifications to receive a lease as required by Section 7 of Circular 1386. The remaining 4/5 of the amount of the bid, together with the first year's rental of $1.00 an acre must be paid and a $5000 corporate surety bond furnished prior to issuance of the lease. All bidders are warned against violations of the provisions of Section 59 of the United States Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids at the discretion of the Secretary of the Interior. Register.

How to make sucker rods last longer



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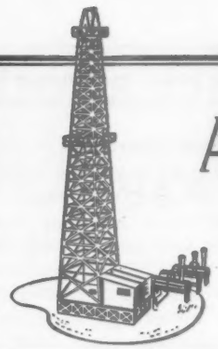

Among the Drilling

California Commission To Ask for Well Bids

CONTRACTORS in California soon may have an opportunity to bid on one or more new directionally drilled wells in the Huntington Beach field.

The California Lands Commission has been granted priorities for the necessary drilling equipment to permit additional development of the Huntington Beach tideland property. The commission soon will call for bids for the drilling of additional wells into the tideland accumulation. Locations are available for only a few additional wells.

Tideland wells are drilled on a bid basis by private operators who pay the state a royalty, based on the bid but in no event shall it be below the general prevailing contract. The usual manner in which contracts are awarded is through sealed bids that are opened in Sacrament. Early contracts were on a high royalty basis but with much of the flush production gone, it is quite likely that new contracts will call for a much lower royalty. All of these wells are directionally drilled and the contracts specify where the wells must be bottomed.

•

CHOATE & BROWN, Midland, Tex., are drilling two wells in Eddy County, New Mexico, for Barney Cockburn, who purchased four completed producers and 440 acres of leases from the Midland operators last week. Choate & Brown received $145,000 in cash and $160,000 in oil from one-eighth of the production.

ROGER LACY, Longview, Tex., is to start work at once on the contract for General American Oil Co. 1 Dora Rodney, 2,600 ft. northwest of the discovery well of the new Coke Paluxy sand pool in Wood County, East Texas. Location is 660 ft. from the north and east lines of a 50-acre tract in the Manuel Y'Barbo Survey.

D. THOMASON, Shreveport, La., is building derrick for Horace Turner 1 Hudson, a wildcat in the E. Decker Survey, 10 miles northeast of Carthage in northeastern Panola County, Texas. The well is the fifth test for the area which was opened by Turner and Smith.

GILGER Drilling Co., Houston, Tex., has the contract for Roland S. Bond 1 J. H. Overton et al in the Big Island area, Rapides Parish, Louisiana. The well is in NW SE 15-4n-3e.

TOM F. HUNTER, Wichita Falls, Tex., who assembled the acreage and sold a three-quarter interest to the operating company has the contract to drill American Liberty Oil Co., Dallas, Tex., 1 S. T. Tuttle, Jr., 660 ft. from the north and west lines of Block 174, Waggoner Colony subdivision, Wichita County, Texas. The wildcat, contracted to 5,000 ft., is on a 3,000-acre block.

THOMPSON-CARR, Inc., Houston, Tex., has the contract and is moving in derrick for a 5,000-ft. wildcat in Crane County, West Texas, the Texas Co. 1 George C. Fraser, NW NE Section 19, Block 42, Township 4s. T.&P. Survey, 8 miles east of the Waddell pool and 7 miles northeast of the Dune pool.

PARKER Drilling Co., Tulsa, has the contract for Amerada Petroleum Corp. 1 Annie E. Williams, a 5,500-ft., or Ellenburger, wildcat in the William Cassell Survey, Throckmorton County, Texas, 4 miles north of Elbert in the northeast part of the county. W. T. Robinson is moving from Odessa, Tex., to Olney, Tex., to superintend the drilling.

ROWAN Drilling Co., Houston, Tex., received contract from Arkansas Fuel Oil Co. for 1 Jackson, a 9,600-ft. wildcat, 5 miles southeast of Doube Bayou, Chambers County, Texas. Material is being moved to location.

WYNN CROSBY Drilling Co., of Houston, Tex., has spudded British American Oil Co. 1 Street, a wildcat in the Pearland area, Brazoria County, Texas.

HOUSTON Drilling Co., Houston, Tex., was moving in rotary for a new test to be drilled in the Harmon field, Jackson County, Texas. The well is Gulfboard Oil Co. 1 McCory. The new well is a north offset to the discovery producer.

JORDAN Drilling Co., Houston, Tex., is preparing to test 1 Munson, in the Livingston field, Polk County, Texas, which is expected to open new production from the Wilcox sand. Total depth is 7,397 ft., and

Crew of Humble Oil & Refining Co. at West Costell, Louisiana. Front row: E. M. McGhin; Hugh Harris, petroleum engineer; E. L. Mayfield; W. H. Arnold, driller. Back row: J. E. Kastrop, petroleum engineer; F. L. Lively, tool pusher; R. P. Hairstone; C. E. Schram, and L. L. Green

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Contractors

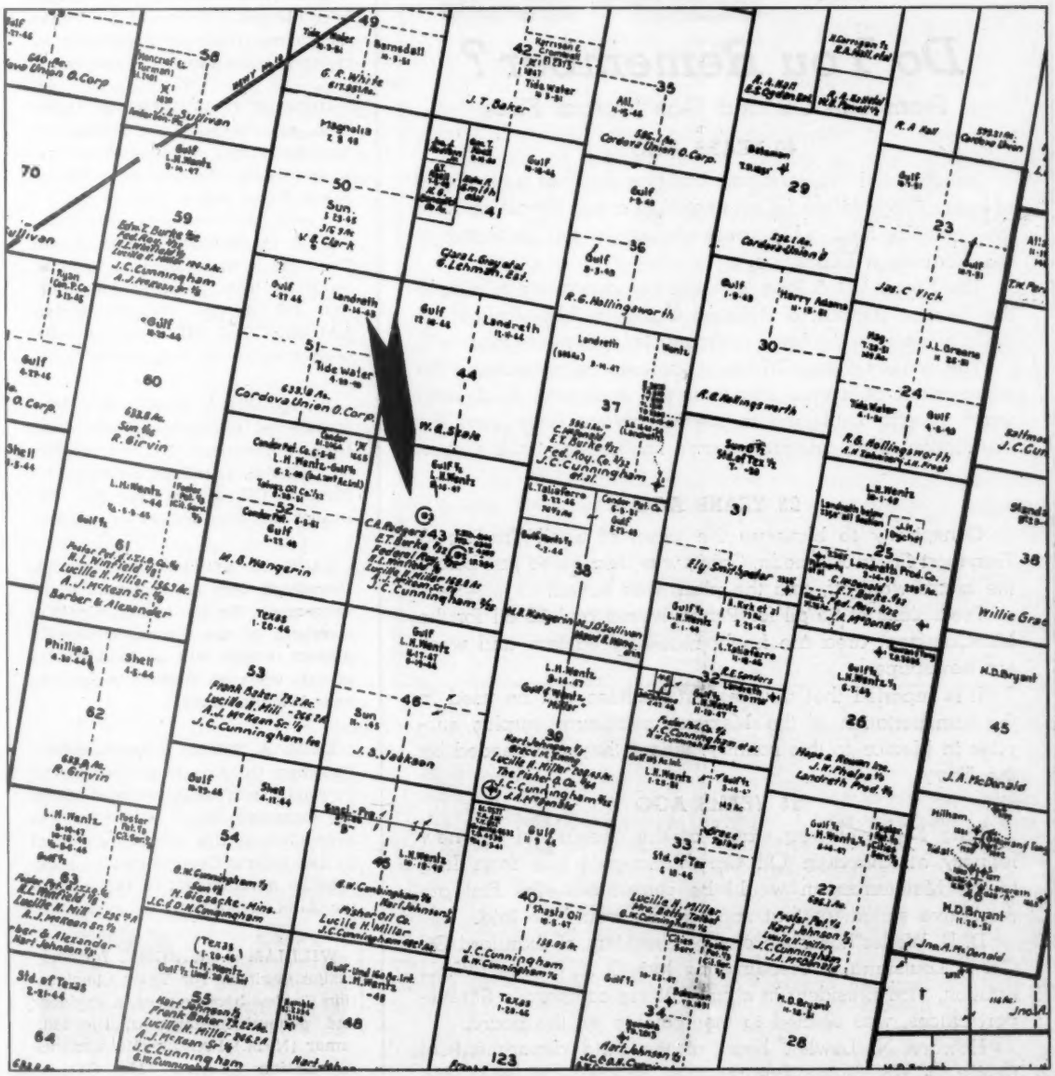
casing was cemented to test sand at 7,035-48 ft. A drill-stem test of the sand recovered pipe-line oil.

PETROLEUM Well Servicing Co., Houston, Tex., received contract from W. S. Boyle et al for 1 Rose & Sample, a wildcat 4 miles southeast of Ganado in the G. Sutherland Survey, Jackson County, Texas.

FAIN Drilling Co., Houston, Tex., received contract from Pure Oil Co. for a deep test in Cameron County, Texas, about midway between Port Isabel and Brownsville. In the Cistern area, Fayette County, Texas, gas production was opened for Continental Oil Co. with the completion of 1 Gabitzsch, which is flowing from the Wilcox sand at 2,800 ft.

HARRY L. EDWARDS Drilling Co., Houston, Tex., has received contract for several new operations. In coastal Louisiana, a rotary was being moved to the Valentine field, La Fourche Parish, for the Pan American Production Co., while in the same district and in the Vacherine field, derrick was being built for a wildcat test for Cities Service Oil Co. On the Texas coast, contracts were received from the Pan American and Continental Oil Co. for two wells to be drilled in the Pierce Junction and St. Charles fields in Harris County, Texas, and St. Charles Parish, Louisiana.

O. W. DYER, Houston, Tex., extended production in the Mercy field, San Jacinto County, Texas, about 1 mile north with the completion of Atlantic Refining Co. 1 Palmer which is flowing at the rate of 35 bbl. daily from the Wilcox sand at 8,282-89 ft. Two other Dyer rigs are running for the same company in the Neale field, Beauregard Parish, Louisiana.



Southwest Mapping Co., Fort Worth

Discovery of commercial production in the Hickory sand, a Cambrian formation, at Gulf Oil Corp. and L. H. Wentz 3 Millar, shown here, has added another, deeper prospective horizon to the Permian and Ordovician zones in West Texas and Southeast New Mexico. Pay was found at 4,376-92 ft.

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Personal Paragraphs

JAMES L. RICE, formerly in the production-accounting department of Humble Oil & Refining Co., Houston, Tex., was recently promoted to the rank of first lieutenant at Fort Lewis, Washington. Lieutenant Rice graduated from Texas Military Institute, and also attended University of Houston.

PAUL SLICKER, of the legal department of Texas Co. in New York City, joined the Federal Bureau of Investigation on June 1.

MARSHALL UDDEN has joined the geological staff of Sinclair Prairie Oil Co., at Wichita Falls, Tex. He was formerly of Rock Island, Ill.

CHARLES C. THOMPSON, SR., was recently elected manager of the Recreation Club of Lion Oil Refining Co., succeeding his son who enlisted in the Army this past spring.

H. R. CULLEN, oil man of Houston, Tex., has been elected president of the Houston Symphony for the 1942-43 season. T. E. SWIGART, Shell Oil Co., Inc., was appointed chairman of the board.

HERBERT E. FISHER has been transferred from Stanolind Pipe Line Co.'s Tulsa office to Chicago headquarters of Standard Oil Co. (Indiana), where he joins the staff of F. E. WOOD, which is concerned with products-pipe-line operation.

JOHN R. SUMAN, vice president of Humble Oil & Refining Co., Houston, Tex., was recently awarded an honorary doctor of engineering degree by the South Dakota School of Mines. Dr. Suman delivered the commencement address at the school.

J. A. DANNER, industrial sales promoter in the Chicago area of Standard Oil Co. of Indiana, has retired under the company's pension plan. Mr. Danner's service with the company began more than 26 years ago. He is being succeeded by HARRY G. STILES.

JOHN K. SWANSON, vice president and general manager of Northern Natural Gas Co., of Saskatoon, and the Franco Public Service Co., of Vermilion, Alta, has been named manager of Vermilion Consolidated Oils and its subsidiary, Vermilion Refinery, Ltd., operating in the Vermilion field.

JOHN R. STEELE, formerly inspector for the oil and gas division of Texas Railroad Commission in West Texas, has been transferred to Palestine, from Midland, where he is succeeded by GEORGE ROACH.

FRANK ACKWRIGHT, formerly engineer for Phillips Petroleum Co. at Amarillo, Tex., and now a field artillery officer in the U. S. Army stationed at Fort Sill, Okla., has recently been promoted to the rank of captain.

CHARLES B. McCLINTOCK, consulting engineer for a number of oil properties in the western Pennsylvania and West Virginia regions, has left his home in Oil City, Pa., for Washington, D. C., where he has accepted an appointment in the Office of Petroleum Coordinator. For a number of years Mr. McClintock was employed by South Penn Oil Co. at Bradford, Pa.

W. R. BOYD, III, assistant to the district manager of the southwest division of the Sinclair Refining Co., with headquarters at Fort Worth, Tex., left June 16, for Colorado Springs, Colo., where he will serve in administrative capacity with the rank of captain in the photographic reconnaissance operational training unit of the U. S. Army Air Corps, Captain Boyd was in Fort Worth for 5 years, having formerly been stationed at Atlanta, Ga. He has also been stationed in Detroit, Mich., and New York, N. Y., and several other cities during the 15 years he has been associated with Sinclair.

Do You Remember?

From The Oil and Gas Journal Files

40 YEARS AGO

Jennings Oil Co., Jennings, La., has received a certificate of honorable mention for an exhibit of crude petroleum from the Jennings field, which was shown by the company at the Charleston Exposition.

The Export Oil & Pipe Line Co. has a contract to supply the Central Asphalt & Refining Co. with 7,500 bbl. of oil daily as soon as the latter company is in shape to receive it.

The Waters-Pierce Oil Co. is rumored as considering the construction of a pipe line from the Beaumont field, eastward through Louisiana to the Mississippi River, and the installation of an adequate barge line service on the river.

25 YEARS AGO

Conspiracy to blow up the plant of Shell Trading & Transport Co. at Alameda, Calif., was discovered just before the bomb went off, and the plant was saved.

Predictions of $5 oil for Pennsylvania and $3 oil for the Mid-Continent area are freely made by eastern and western newspapers.

It is reported that government facilities will be used in the transportation of the Mexican petroleum surplus supplies in Mexico to this country, where they are needed by the Navy.

15 YEARS AGO

King Feisal of Iraq stated at the opening of the new refinery at Khanaqin Oil Co. that a pipe line from Iraq to the Mediterranean would be constructed—the first authoritative statement that such a line would be laid.

D. R. Weller has been elected president of Standard Oil Co. of Louisiana, succeeding the late C. K. Clarke. W. L. Stratton, vice president in charge of the company's Shreveport offices, was elected to membership on the board.

Howard N. Lawler, head of the land department of Skelly Oil Co., Tulsa, has resigned and will be associated with Glen Smith and John D. Dwyer, independent oil producers of Tulsa.

O. P. KEENEY, Oil City, Pa., has been elected chairman of the Venango County Division, Associated Petroleum Industries of Pennsylvania.

GEORGE D. BOWERS, of Dallas, Tex., who is with the Cosden Petroleum Corp., is director of the scrap-rubber-collection drive in the North Texas region.

R. R. HARBISON, of Fort Worth, Tex., has been transferred to Wichita Falls, Tex., as scout for Stanolind Oil & Gas Co., to replace LAURENCE S. MELZER, who has been transferred to Amarillo, Tex.

J. GREGORY ROWE has been transferred to Wichita Falls, Tex., from Shreveport, La., to replace ALFRED L. DRAPER as scout for Humble Oil & Refining Co. Mr. Draper has been moved to Houston.

JACK M. COPASS, of Amerada Petroleum Corp., is chairman of arrangements for the annual picnic of members of the Kansas Geological Society, which will be held Friday of this week at Sunnyvale Springs, near Wichita, Kans.

EARL A. SMITH, superintendent, Canadian Oil Co., Ltd., refinery at Petrolia, Ont., has returned from the Canadian West, where he was a member of the committee named by the federal Government to study possible development of the Alberta tar sand deposits.

WILLIAM J. WRIGHT, formerly design engineer for Tyler Construction Co., has become project engineer and general manager of the Maljamar (N. M.) Pressure Maintenance Association project. Mr. Wright spent several years in Java and Sumatra as a repressure engineer for one of the Standard Oil Co. affiliated companies.

WILLIS RYAN and GEORGE GILKERSON, attorneys for Keiger & Gilsaver, Mattoon, Ill., have joined the Army as privates, and have already left for service.

ROSCOE SIMPSON, geologist for the Cardinal Oil Co. at San Angelo, Tex., has returned home after a vacation trip to Corpus Christi, Houston, and Galveston, Tex., and New Orleans, La.

C. A. STANFIELD, of Williams Brothers Corp., Tulsa, addressed the Tulsa Engineers Club this week, and during his address presented a sound motion picture showing construction of the pipe line from Portland, Me., to Montreal, Canada.

E. V. FORAN, of Foran, Boatwright & Knode, consulting engineers in Houston, Tex., has received a commission as major in the Army Engineer Corps and is now on active duty. It was previously reported in error that Mr. Foran had received a commission in the Navy.

JAMES IRVINE, Petrol Corp.; WILLIAM L. MASSIE, Texas Co.; L. C. HAMPTON, Union Oil Co., and DR. FREDERICK WALLER, Pan Pacific Oil Co., were recently presented with awards of distinguished service at a joint meeting of the Kiwanis Club of Los Angeles and a foreign trade week committee.

WILLIAM HURST, for 12 years a research engineer for Humble Oil & Refining Co., has joined the engineering staff of Core Laboratories, Inc., at Dallas, Tex., and has moved his family there from Houston, Tex. In his new position Mr. Hurst will continue to specialize in the application of field data to predicting reservoir-pressure variations.

After reducing 24 lb. to meet requirements, TRACEY COWELL, Corpus Christi, Tex., formerly an independent operator at San Angelo, Tex., has been commissioned as lieutenant commander in the U. S. Navy. Mr. Cowell is a graduate of the naval school at Culver Military Academy.

It's Dr. Goldsmith Now

Another oil man who has been honored by his alma mater, by being awarded an honorary degree, is Lester M. Goldsmith, chief engineer of Atlantic Refining Co., Philadelphia, Pa. Mr. Goldsmith was granted the honorary degree of doctor of science, by Drexel Institute of Technology, Philadelphia, last Saturday. This was the first time in its history that the college, which is this year celebrating the fiftieth anniversary of its founding, conferred honorary doctor degrees.

LESTER M. GOLDSMITH

Mr. Goldsmith was cited as "an engineer of national distinction, particularly in the field of petroleum transportation, and a recognized authority on the propulsion of ships by both diesel engines and steam turbines. His contributions have signally advanced the state of naval engineering and have greatly promoted the welfare of our country in time of peace no less than in time of war."

Mr. Goldsmith received nation-wide acclaim for his direction of the salvaging of his company's S. S. "E. H. Blum," one of the world's largest tankers, which, wrecked east of the Virginia Capes in February by five explosions, had been abandoned by marine experts.

He is a native of Pottsville, Pa., and was graduated from Drexel in 1914, as an electrical engineer. He entered the employ of Atlantic in 1916 as a mechanical draftsman. He successively served as research engineer and engineer of tests. In 1923 he was made manager of the general engineering and construction department, and in 1937 chief engineer. He is vice president and chief engineer of Atlantic Pipe Line Co., a director of Atlantic Oil Shipping Co., chief engineer of Keystone Pipe Line Co., and chief engineer of Buffalo Pipe Line Corp.

In 1939 he was awarded the Melville Medal at the annual meeting of the A.S.M.E.

KENNETH A. COVELL, division engineer for Pure Oil Co. at Fort Worth, Tex., has been made a vice president of the Fort Worth Engineers' Club.

WILLIAM H. MORGAN, of R. R. Bush Oil Co., has been elected chairman of the California Heavy Crude Oil Committee, which will attempt to collect and present pertinent data to the OPA for consideration at an early date.

CARL ABEL, of Ethyl Gasoline Corp., was the principal speaker at the last monthly meeting of the Taft, Calif., chapter of the California Natural Gasoline Association and discussed "Fuels and Engines of the Future."

FLOYD BRETT, formerly district superintendent for Sinclair Prairie Oil Co. at Troop, Tex., has been transferred to Fort Worth, Tex., where he becomes assistant to the division superintendent of production.

ALBERT S. BAPTIE, who has been an engineer in the exploitation department of Shell Oil Co., Inc., in the San Joaquin Valley division, has been appointed division superintendent of the company's Long Beach office in the Los Angeles division.

HERBERT E. DeLEE, formerly an independent oil operator, who has served since January in the Dallas, Tex., office of the WPB as industrial oil specialist, has left for Camp Sutton, N. C., where he will serve as a major in the Army Ordnance Department.

WILLIAM G. SKELLY, president of Skelly Oil Co., Tulsa, who last week celebrated his sixty-fourth birthday, has been named state chairman of Oklahoma of the nation-wide scrap-rubber drive which got under way this week. Upon receipt of the official announcement from the OPC, Mr. Skelly appointed GLEN AMES, district manager in Tulsa for Phillips Petroleum Co., as vice chairman.

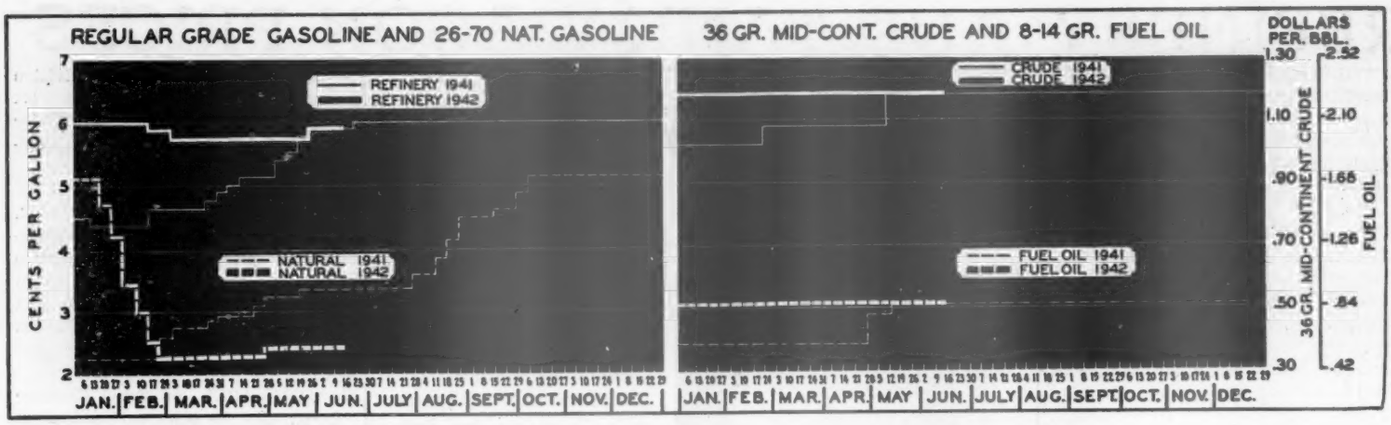
Shifts: DONALD R. RYAN, purchasing agent, Standard Oil Co. of Indiana, Mattoon, Ill., to Stanolind Oil Purchasing Co., Tyler, Tex.; FRANK LUDLUM, engineer, Stanolind Pipe Line Co., Niota, Ill., to Payson, Okla.; J. M. COLLINS, superintendent, J. E. Trigg Co., Oklahoma City, to Pawnee, Okla.; C. L. KELLEY, engineer, Stanolind Oil & Gas Co., Grandfalls to Imperial, Tex.; VIRGIL FRONTERHOUSE, superintendent of Herschbach-McCullah Drilling Co., Monahans, Tex., to Magnolia Petroleum Co., Great Bend, Kans.; J. T. BOWEN, engineer, Humble Pipe Line Co., Corpus Christi to San Antonio, Tex.; JOHN M. PALMER, engineer, Shell Oil Co., Inc., Denver City to Midland, Tex.; A. S. ROGERS, geologist, Skelly Oil Co., Mound City, Mo., to Troy, Kans.; H. B. MAUST, engineer, Texas Co., Clarksville, Tex., to Oberlin, La.; FIRST LT. JOHN A. LIMING, engineer, Stanolind Oil & Gas Co., Rogers, Neb., to Camp Wolters, Tex.; W. B. LARK, engineer, Pasotex Pipe Line Co., El Paso to Houston, Tex.

MARK TERRY, assistant division production superintendent in charge of Illinois for Texas Co., has changed his office from Salem to Mattoon, Ill. DON ROUNDS has been transferred from Salem to Mattoon, and PAUL YOUNGMEYER has been transferred from Mattoon to Wichita, Kans., to head the land department.

ROBERT R. HOBSON, general manager of Houston Oil Co., celebrated his fortieth anniversary with the company on May 16. He started with the Higgins Oil & Fuel Co. in 1902, and is now a director of Houston Oil as well as general manager. His 40-year gold service button was the first to be given by the company. F. H. ROBINSON also received his 40-year service button from the company last month.

SECOND LT. STEPHEN S. BROWN, former petroleum engineer at Tyler, Tex., has been appointed assistant officer in charge, post security section, at Keesler Field, air corps technical school. Lieutenant Brown, commissioned in 1935, reported to Keesler Field in April 1942 from Tyler.

LESLIE C. CASE, with Gulf Oil Corp. in Tulsa, will lecture on "Role of Chemistry in the Discovery and Production of Petroleum," June 18, at Gibson Island, Md., during a special research conference being held by the American Association for the Advancement of Science. This is one of 10 conferences the society is holding. C. R. WAGNER, Pure Oil Co., Chicago, is chairman of the group which will discuss "Frontiers in Petroleum Chemistry." On the same program, ARTHUR L. LYMAN, Standard Oil Co. of California, will talk on "Oxidation of High Molecular Weight Hydrocarbons."



MARKET DEVELOPMENTS . . .

Mid-Continent

HIGH demand for all petroleum products, from gasoline down to residual fuel oils, continued the steady condition of the Mid-Continent refinery market this week. Middle West jobbers are making active inquiries for motor fuel, distillate, and residual burning oils for prompt shipment and, according to reports in refinery circles, are being forced to canvass the market in order to satisfy requirements.

There is little evidence that seasonal factors are of more than incidental importance in the current refinery market. There is an increase in general demand but indications are that defense industries and the war program are accounting for most of the bulge in consumption. Detailed data on war consumption of petroleum products are diffused and suppressed but there is indication that most estimates on military and defense-industry have been too conservative.

Another factor in the current strong position of the Mid-Continent market is the adjustment of refinery operations to reduce production of gasoline and increase yields of fuel oil. Several refiners are purchasing gasoline in the open market in an effort to offset the curtailment in their own production of motor fuel.

The Mid-Continent motor-fuel price is unchanged at a range of 5.375 to 5.750 cents per gallon.

Gulf Coast

HOUSTON, Tex.—Movement of several cargoes of lend-lease material, consisting of gasoline, aviation-base naphtha and fuel oil, was reported from Gulf Coast ports during the past several days. This is the first tanker movement to be reported in several weeks and while the amount of material lifted was not made known, it is believed to have been sufficient to temporarily relieve the acute storage situation at several refineries.

Activity in the Gulf Coast refinery markets is still governed by availability of tank cars and barges. Strong demand for major refined products still exist, but transportation limits the volume of business. As there is little possibility that this situation can be corrected soon, most observers are of the opinion that refining facilities in the area will be readjusted strictly to the manufacture of war products and such operations are expected to follow plans of the District 3 general committee recently approved by OPC.

Another reduction in crude runs was reported by the Gulf Coast Refiners Association in its report of operations ending May 1. Crude runs for the 14 reporting companies totaled 1,306,930 bbl. which was at the rate of 81,656 bbl. daily or 48 per cent of total rated capacity. This is the lowest rate of operations that has ever been reported by the association's refiners.

SENTENCE SUMMARIES

MID-CONTINENT: Demand increasing because of industrial activity. Tourist buying only a moderate factor.

GULF COAST: Cargo loading for lend-lease accounts removes part of distress products. Tank-car and regional deliveries steady.

EAST COAST: Fuel purchases active in preparation for next winter and for higher industrial consumption.

PENNSYLVANIA: Sales of all products holding at high levels. Stocks diminishing at moderate rate.

PACIFIC COAST: Gasoline trading at reduced rate. Calls for fuel oil continue at increasing volume. Prices steady and unchanged.

Pacific Coast

LOS ANGELES, Calif. — Liquidation of excess stocks of gasoline is under way by smaller independent marketers. Large marketers also report that excess stocks are being reduced in orderly fashion. Intercompany sales of gasoline

A.P.I. REFINERY REPORT

Week Ended June 6, 1942

(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks: Gasoline	Residual	Gas oil
Appalachian	158	3,377	585	444
Ind., Ill., Ky.	711	18,690	3,123	2,961
Okla., Kans., Mo.	330	8,623	1,819	1,133
Censored area*	1,588	43,021	17,336	15,032
Rockies	82	2,514	578	321
California	582	17,080	56,315	11,644
Total June 6, 1942	3,451	93,305	79,556	31,535
Total May 30, 1942	3,522	95,355	79,628	31,384
Total June 7, 1941	3,909	91,890	91,961	36,206

Note: Refinery runs and stocks for week ended June 13, 1942, appear on Trends page.

*Reports combined on East Coast, Texas Gulf, Louisiana-Arkansas and inland Texas at request of OPC.

CRUDE-OIL STOCKS

(Bureau of Mines estimate)

Week ended:	Bbl. of crude*
June 6, 1942	254,316,000
May 30, 1942	255,023,000
June 7, 1941	260,956,000

*Excludes heavy, unrefinable stocks in California.

have practically ceased because of low spot prices. This is the first time this year that such a policy has been in effect.

Fuel-oil demand continues high after a general decline of a few weeks' duration. A long-term view indicates that fuel-oil demand will show a large increase later this year. The Southern Pacific Railroad is hauling more freight than at any time in history. This has been made possible by the borrowing of locomotives and receipt of some that were building. Railroad officials expect freight and passenger traffic to reach high points later this year. Railroad operations on the Pacific Coast are important in the consumption of heavy fuel oil.

Demand for diesel and distillate fuels continues and stocks which piled up last year are being consistently reduced.

Natural-gasoline demand is unchanged but may be influenced by reductions of butane in liquid petroleum gases as ordered by the OPC and to be carried out by the production committee of District 5.

East Coast

NEW YORK.—East Coast oil suppliers report that with approval of steel for a major pipe line from Texas oil fields to Salem, Ill., a solution to the transportation situation affecting future supplies of petroleum in this area appears possible.

The objective of the industry is to maintain East Coast refinery runs at a minimum of 400,000 bbl. daily. Completion of the 24-in. pipe line may permit runs higher than the minimum goal, assuming some crude imports by tanker.

Undoubtedly there will be an increased demand for heavy crudes in coming months, yielding a heavy percentage of fuel oil. It is evident that the East Coast oil trade will have to use all possible means to increase heavy fuel-oil yields in order to meet the essential demands during the 1942-43 heating season.

Now that some relief is in sight with respect to transportation conditions, the industry is concentrating efforts to impress on Washington the need for financial relief from the high costs now being absorbed by the oil companies.

Caught between mounting distribution costs and OPA price ceilings, the existence of many of these distributors is now threatened, with pleas for relief so far unanswered.

It is pointed out that the relatively few major oil companies will be unable to supply the needs of the thousands of customers of these small distributors, pressed as they are with their own financial and operating problems. Thus, failure to bring early relief will jeopardize the industry's entire efforts thus far to meet the fuel-oil crisis, oil men here assert.

REFINERY AND TANK-WAGON PRICES

(Prices as of June 16)

Refinery Gasoline

Octane (A.S.T.M.):	†80	78	74-76	72-74	68-70	63-66	60 & lower
Mid-Continent*	.....	.....	.....	5.625-5.750	.....	5.250-5.375	4.875-5.000
Pennsylvania	.....	.....	6.750-7.000	.....	.....	.....	.....
Gulf Coast‡	6.00-6.50	.....	.....	§5.750-6.250	§5.750-6.250	§5.250-5.750	§5.000-5.500
Northeast Coast	9.700	.....	.....	9.200	9.200	.....	.....
Pacific Coast	.....	6.500-6.750	6.125-6.250	6.250-6.500	5.750-6.250	5.25-5.50	4750-5.000

*Basis Group 3. †1939 C.F.R. (research method). ‡Integrated companies restricted to lowest prices. §Unleaded.

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.

Natural Gasoline

Grades:	26-70	18-55	75-85(350-375)
Oklahoma (Group 3)	2.375	2.750-2.875	.....
North Texas	2.000	2.375-2.500	.....
North Louisiana	2.125	2.500-2.625	.....
California	.....	.....	5.000-5.500

Kerosene and No. 1 Fuel Oil

Gravity:	46	45	42-44	41-43	38-40
Mid-Continent*	.....	.....	4.500-4.750	4.375-4.625	.....
North Louisiana	.....	.....	.....	4.500-4.750	.....
Pennsylvania	6.250	6.125-6.250	.....	.....	.....
California	.....	.....	.....	4.500-6.000	4.500
Northeast Coast	.....	.....	.....	5.700	.....
Gulf Coast	.....	.....	.....	3.875	.....

*Basis Oklahoma Group 3.

Tractor, Diesel, and Bunker Fuel Oil

Specifications:	46-48° G.	24 D.I.	48-52 D.I.	58 & above	Diesel bunkers	Bunker C
Mid-Continent*	4.125	.....	.....	.....	.....	.....
California	.....	2.750-4.000	.....	.....	‡$1.35-1.45	$0.85-0.90
Gulf Coast	.....	.....	4.000	4.125	1.45	0.85
Northeast Coast	.....	.....	.....	5.800	2.222	1.80
North Louisiana	.....	.....	.....	.....	.....	†0.80-0.85

*Basis Oklahoma Group 3. †10-14° gravity. ‡Pacific Specification 200.

Furnace Oil, Gas Oil, Fuel Oil

	No. 2	No. 3	No. 5	No. 6
Mid-Continent*	3.500-3.625	3.375-3.500	$0.85	$0.85
Pennsylvania (West)	5.625-5.875	5.375-5.875	†5.250-5.500	.....
Northeast Coast	5.8	5.8	1.85	1.80
Pacific Coast	5.5	5.5	‡0.80-95	§0.80
Gulf Coast	3.875-4.0	.....	1.65	0.85

*Basis Oklahoma Group 3. †36-40 gravity fuel oil. ‡Pacific Specification 300. §Pacific Specification 400.

Lubricating Oils

Bright and Steam Refined

OKLAHOMA (Group 3)—		
200-210 D, 10-25		27.00
150-160 D, 0-10		23.00
120-125 D, 0-10		22.90
Steam refined:		
600 dark green (untreated)	9.00	9.50
PENNSYLVANIA—		
Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		30.50
15 pour point		29.50
25 pour point	25.00	28.00
Steam refined:		
600	15.00	16.00
650	15.50	16.50
600 flash	16.00	17.50
630 flash	17.00	17.50

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—	
0-10 pour point:	
200-3	15.00
300-3	18.00
500-3	19.50
600-3	20.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

Neutral Oil

CALIFORNIA		
Pale oils:		
200-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25
GULF COAST—		
Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	12.25	12.50
PENNSYLVANIA—		
150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pour point		38.50
10 pour point		37.50
15 pour point		36.50
25 pour point		31.00
200 vis., at 70° F., 3 color:		
Zero pour point		40.50
10 pour point		39.50
15 pour point		38.50
25 pour point		33.00

Wax

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	4.350-4.550
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	4.250
124-126 (A.m.p.) w.c. scale	4.250
NEW YORK—	
Wax in bags fully refined:	
130-132 (A.m.p.) wax	6.250
133-135 (A.m.p.) wax	6.550
Crude scale:	
124-126 (A.m.p.) w.s.	4.350-4.455
124-126 (A.m.p.) y.s.	4.350-4.455

EXPORT PRICES

Gasoline—60-62° Gravity, Maximum 400 End Point

Octane:	72-74	68-70	65-66	60
Gulf Coast	6.500	6.250-6.500	5.875	5.625
Pacific Coast	.....	6.125-6.500	5.875-6.000	5.500-5.625

Distillate and Fuel Oil

	Kerosene	Diesel fuel				Bunker
	41-43	24 G.	48-52 D.I.	58 D.I.	Bunkers	C grade
Gulf Coast	4.000-4.250	.....	4.125-4.375	4.375	$1.65-80	$0.85-95
Pacific Coast	4.750-5.000	1.25-30	.....	....	†1.35-45	*0.80-90

*Pacific Specification 400. †Pacific Specification 200.

Lubricating Oils

	Neutral oils		Bright and cylinder stocks		
	200-3	150-3	200-3	150-3	600&630 S.R.
Mid-Continent	16.8	....	28.8	24.8	.....
Pennsylvania	43-50	41-46	36-37	34-37	26.5-27

GASOLINE AND KEROSENE TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades, tax included, undivided dealer)

ATLANTIC AND NEW ENGLAND

(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Baltimore, Md.	15.05	5.50	9.10
Boston, Mass.	14.50	4.50	8.40
Burlington, Vt.	16.50	5.50	...
Buffalo, N. Y.	15.80	5.50	9.20
Dover, Del.	16.30	5.50	10.80
Hartford, Conn.	15.20	4.50	...
Manchester, N. H.	16.90	5.50	9.40
Newark, N. J.	14.30	4.50	8.30
New York, N. Y.	15.70	5.50	8.40
Philadelphia, Pa.	15.80	5.50	10.55
Pittsburgh, Pa.	16.30	5.50	10.90
Portland, Me.	15.90	5.50	8.50
Providence, R. I.	14.60	4.50	8.20
Washington, D. C.	14.30	3.50	9.60
Average 14 cities	15.51	5.07	9.28

(All prices undivided dealer basis.)

CENTRAL

(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co. and Texas Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Chicago, Ill.	14.10	4.50	10.30
Cleveland, Ohio	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	11.90	4.50	9.80
Detroit, Mich.	14.40	4.50	9.60
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind.	15.20	5.50	9.80
Little Rock, Ark.	17.50	8.00	10.00
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	16.50	7.00	8.50
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	15.03	5.57	9.61

*Includes 1-cent state tax.

SOUTHEASTERN

(Standard Oil Companies of New Jersey, Kentucky, and Louisiana)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Atlanta, Ga.	19.00	7.50	9.40
Birmingham, Ala.	19.60	8.50	9.00
Charleston, S. C.	18.55	7.50	...
Charleston, W. Va.	18.85	6.50	11.90
Charlotte, N. C.	19.70	7.50	9.90
Jacksonville, Fla.	19.00	8.50	8.40
Jackson, Miss.	18.00	7.50	8.50
Louisville, Ky.	17.00	6.50	8.50
Memphis, Tenn.	17.75	8.50	10.50
New Orleans, La.	17.25	8.50	*10.00
Norfolk, Va.	17.05	6.50	10.60
Average 11 cities	18.34	7.59	9.67

*Includes 1-cent state tax.

MIDWESTERN

(Continental Oil Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Albuquerque, N. M.	17.50	7.50	10.00
Boise, Idaho	20.10	6.50	16.50
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	12.88

PACIFIC COAST

(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Portland, Ore.	17.00	6.50	13.50
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	6.50	13.50
Average 3 cities	16.17	5.83	12.83
Average 50 cities	16.53	5.96	10.30
Average last week	16.57	5.96	10.30

Canadian Fields

(Continued from Page 85)

and barges to Fort Norman. Four new outfits have been moved north, and drilling crews have arrived in the field.

Southeastern Saskatchewan

Following geological surveys and drilling of shallow test wells on a 5,000-sq. mile area in southeastern Saskatchewan, Bobjo Mines will this season undertake the drilling of deeper tests. Operations will be in charge of L. J. Jowsey. The Bobjo concession from the Saskatchewan Government is approximately 100 miles east of the deep test being drilled by Northwest Co. on the Norcanols concession near Radville.

Revive Dutton Field

In Elgin County, Ontario, systematic efforts will be made by Empire Natural Gas to recondition wells in the old Dutton shallow field in Dunwich Township. The field, which got its production from the Onondaga limestone around 400 ft., has been inactive for many years. Operations will cover a 59-well lease, and the work has been contracted to National Oil Well Contractors at a price of $50,000. If the experiment is successful, similar operations will probably be undertaken in other former shallow fields in southwestern Ontario.

Crude-Oil Prices

Representative selected crude prices from all sections of the country appear below:

East Texas	$1.25
Conroe	1.43
Tepetate, Louisiana	1.18
Smackover, Arkansas, heavy	.83
Illinois basin	1.37
Pecos County, Texas	.95
Lance Creek, Wyoming	1.12
Bradford, Pennsylvania	3.00

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast, Texas	West Texas*
18-18.9	$0.80	...	...	...
19-19.9	.84	...	$1.06	$0.70
20-20.9	.88	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.82
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.23	1.05	1.28	.92
31-31.9	....	1.07	1.30	.94
32-32.9	....	1.09	1.32	.96
33-33.9	....	1.11	1.34	.98
34-34.9	....	1.13	1.36	1.00
35-35.9	....	1.15	1.38	1.02
36-36.9	....	1.17	1.40	1.04
37-37.9	....	1.19	1.42	1.06
38-38.9	....	1.21	1.44	1.08
39-39.9	....	1.23	1.46	1.10
40 and above	....	1.25	1.48	1.12

*Includes Lea County, New Mexico.

Information Supplied by "Oil and Gas Journal"

The urgent need for casing, plus restrictions on shutting down old producing wells, has led to a study of the possibility of salvaging casing from old wells without stopping production. A study of the casing programs of 10 and 20 years ago shows that the possibility does exist.

For example, a well drilled in 1927 on Signal Hill had 13" casing cemented at 1,118 feet; 8⅝" casing cemented at 4,374 feet; 6¼" casing cemented with 45 sacks at 4,750 feet and 4½" casing landed at 5,463 feet and perforated in the producing zone at 5,000 to 5,463 feet.

Four thousand feet of 6¼", and four thousand five hundred feet of 4½" casing were removed without impairing the production of the well. This is more than enough casing to equip two average wells.

There are many wells similarly equipped, and there are others from which shorter strings of surface or intermediate casing could be removed. Where a permit will allow abandonment of wells that are not paying the cost of operation, every effort should be made to recover the maximum amount of casing.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.
MOLYBDIC OXIDE—BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

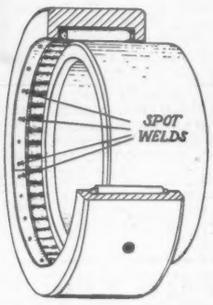
Climax Molybdenum Company
500 Fifth Avenue, New York City

MOLY

EQUIPMENT PROGRESS...

Design Improvement Speeds Production of Bantam Quill Bearings

An improved method of installing the roller retaining rings of the Bantam quill bearings by spot welding not only gives a sturdier, more permanent assembly, but considerably speeds up production of this antifriction unit.



As illustrated in the accompanying sectional view, the large number of small diameter rollers are held in place in the outer race by retaining rings. Not only does the new spot welding method simplify machining operation — thus speeding assembly — but it gives a positively located and permanently placed band which will not snap loose under any ordinary conditions.

The illustration also shows another important design feature of this compact unit. That is, that when in service, the entire load is carried to the solid outer race—none of the load, axial or thrust, is against the retaining rings which serve solely to hold the rollers in place, facilitating handling, assembly, and disassembly.

Materials handling equipment, automotive assemblies, speed control equipment, many machine-tool applications, and in petroleum-producing machinery are among the important fields where the Quill bearing has demonstrated its exceptional efficiency over the period of more than 4 years since it was first introduced by Bantam Bearings Corp., South Bend, Ind. Further information on types, sizes, ratings, and other data is given in the Bantam Quill Bearing catalog, copies of which are available on request.

Cabot Shops, Inc., Receive Munitions Contract

Cabot Shops, Inc., manufacturers of oil-well pumping units and oil-field surface equipment, distributed through Frick-Reid Supply Corp., has recently received a munitions contract through the St. Louis branch of the Ordnance Department.

Cabot is now expanding its plant facilities and installing equipment which will be used in the manufacture of gun steel and gun tube forgings. To this extent at least the Cabot organization will be effectively employed during the period in which normal business dislocations have become the rule rather than the exception.

TRADE LITERATURE

LEEDS & NORTHRUP CO., 4934 Stenton Avenue, Philadelphia, Pa.—"Modern Precision," which contains news of L.&N. instruments, controls, and heat-treating methods, and of the jobs they are doing in industry, in research laboratories and in teaching and testing. An addition to other L.&N. literature, it supplements the regular catalogs, bulletins, and circulars which will continue to be issued as before. Modern Precision has 16 pages, 10½ in. by 15⅝ in.

EVERLASTING VALVE CO., 49 Fisk Street, Jersey City, N. J.—An informative 32-page bulletin describing quick-operating valves for blowoff water columns, and other boiler-room services. The bulletin is profusely illustrated with large, self-explanatory views which clearly show the design and construction of the various valve types. Complete tables of specifications, dimensions, and prices are also included to make the bulletin comprehensive.

S. F. BOWSER & CO., INC., Fort Wayne, Ind.—A 40-page catalog of the company's line of industrial equipment for the handling and control of industrial liquids. This catalog will afford the reader a comprehensive understanding of the wide range and extent of the line. It is profusely illustrated.

BJ Offers New Casing Pump Anchor

The increasing use of casing pumps is responsible for this successful, new device for safely anchoring of such pumps and for prompt release when it is necessary to remove them from the well.

The large-area slips have diagonal-cut teeth, and the hazard of damage to the casing is minimized. The body is welded to the tubing nipple which is free to move through the anchor cage a sufficient distance to set the slips when the following easy method is used:

Casing pumps usually are run in the well on the sucker rods, with the BJ casing pump anchor coupled to the lower end of the pump. The anchor cage is equipped with friction shoes which contact the casing, and when the desired depth has been reached the rod string is raised until the key on the nipple comes out of the pocket in the anchor cage. Rotation to the right brings this key over its keyway and then by lowering the string the anchor holds the actuator and slips and the body expands the slips and sets them against the casing.

Detailed information as to sizes and prices is obtainable from Byron Jackson Co., Houston, Los Angeles, or New York.

The illustration at left shows the slip arrangement which is similar to that used in BJ tubing catchers. When it is necessary to remove the pump from the well, the diagonal-cut teeth on the anchor slips readily release from the casing.

Wickers are provided on the upper portion of the nipple to provide for easier fishing, without adding to the difficulty of recovering the string.

Haering Announces New Corrosion Inhibitor

A new corrosion inhibitor is identified as ferri chrom glucosate. This new inhibitor is the ferric salt of quachrom glucosate and introduces a nonoxidizing chromium inhibitor for the first time. Ferri chrom glucosate controls corrosion in some applications in concentrations as low as two parts per million and may be employed in reducing equilibria and at low pH values for corrosion control.

Ferri chrom glucosate is a colloidal gel which may be used for film formation in process operations by dipping or spraying or may be incorporated in paints or lubricants for corrosion control.

Ferri chrom glucosate contains very little chromium and is nonirritating to handle. Its use for corrosion applications may reduce chromium consumption for this purpose as much as two decimals at the same time providing more effective control.

Complete information regarding this important new development may be obtained from D. W. Haering & Co., Inc., 205 West Wacker Drive, Chicago, Ill.

New Cement Dump by Shull Perforating Co.

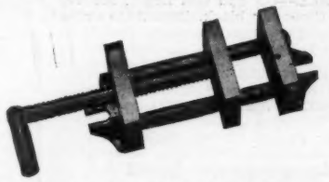
A new cement dump with several novel features has been developed by Shull Perforating Co., 2750 Cherry Avenue, Long Beach, Calif. The ground seat and ball dump valve provides positive closure as the dump is lowered into the well. Pressure in the well increases the tightness of the seat and prevents dilution and cement losses which are so often encountered in ordinary cement dumps. Another improvement is the automatic tripping mechanism. It opens the dump valve simply by upward movement of the sand line. This puts the dump under complete control of the operator at all times and permits the placing of cement or chemical in the well casing exactly where it is wanted, without dilution or loss. Jerks on the line due to faulty spooling cannot trip the dump release. With the tripping release operated from above rather than by hitting bottom, much time is saved on cement jobs as repeated trips can be made without having to wait for hardening. This device is machined from alloy steel to resist strains resulting from high-speed operation. Sizes range from 1½ in. to 4½ in.

Foxboro Issues New Pumping-Control Bulletin

Foxboro Co., Foxboro, Mass.—An attractive new bulletin describing Rotax electric-operated control as employed in pumping applications. Rotax controllers of the recording and indicating type are shown, together with specimen chart records and installation photos. The text is largely devoted to water-works and sewage engineering but also covers pumping applications which are common in various industrial fields. Schematic diagrams of typical pumping installations are given. Copies of the bulletin, No. B-294, will be sent on request.

All-Steel Drill-Press Vise

A simple inexpensive and practical all-steel drill-press vise has been designed to meet all shop conditions. In all three working positions it lies flat on the



face plate. Square thread operates against a bronze thrust bushing. The use of two guide bars permits the operator to drill completely through the work without injury to the vise, thereby speeding up production. It is adapted to small assembly work and to hold small pieces for machinery, filing, etc., during bench operations. Made in two sizes, that illustrated is 5½ in. opening, with ears to fasten to face plate. Made also with 3-in. opening, without ears, otherwise the same sturdy construction. The vise is the product of Patterson-Ballagh Corp., 1900 East Sixty-fifth Street, Los Angeles, Calif.

Worthington-Gamon Elects Officers

Harry C. Beaver has been elected president of Worthington-Gamon Meter Co. to succeed the late E. T. Fishwick. Mr. Beaver is also president of the Worthington Pump & Machinery Corp.

R. R. Anderson, treasurer and manager of Worthington-Gamon Meter Co., has been elected vice president and director, as well as retaining his office as treasurer.

CLASSIFIED ADVERTISING

THE MARKET PLACE OF THE OIL INDUSTRY . . .

Patent Attorneys

PATENTS — TRADE MARKS

All cases submitted given personal attention.

Form "Evidence of Conception" with instructions for use and "Schedule of Government and Attorney's Fees"—FREE.

LANCASTER, ALLWINE & ROMMEL
Patent Law Offices
418 Bowen Bldg., Washington, D. C.

Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little Rock, Ark.

LEASES ROYALTIES
PRODUCING OR NONPRODUCING
Texas, New Mexico, Oklahoma, Louisiana and Illinois
20 Years Experience
Inquiries Invited
B. D. BUCKLEY
Paul Brown Bldg., St. Louis, Mo.

FOR SALE: Oil and gas leases, small production, drilling propositions, fluorspar and rock asphalt deposits. Reports and maps furnished on request. W. P. Harley, Bowling Green, Ky.

CHEAP CRANE COUNTY Sec. 18, B28, under Magnolia-Stanolind leases. Jefferson Smith, 215 Littlefield Bldg., Austin, Tex.

SOUTH DAKOTA BASIN: Follow the big boys. Commercial Leases, active counties. Tracts 40 acres up. 8 to 10 years to run, ten cents per acre yearly rental. Opinions of Title furnished, $100.00 per 40. Cheap speculation with merit and possibilities. Also large drilling blocks with favorable geology. Map furnished on each sale. Inquiries solicited. Dakota Oil Exploration Company, Box 436, Pierre, S. D.

MICHIGAN: — Will secure on order Leases, and Drilling Blocks, William J. Morriss—70 Highland Ave., Highland Park, Michigan—To. 8-1203.

FOR SALE: All or part 160 acre oil lease, shallow flood district, also spudder. 3502 S. Peoria, Tulsa, Okla.

FOR SALE—Oil and Gas Lease, Middle of Major Company block, immediate drilling possibilities, must sacrifice. Box 618, Great Bend, Kansas.

FOR LEASE: 640 A. Cheyenne County, Colo. 160 A. Wagoner Co., Okla. NE 13-18N-19E. 600 A. Adair Co., Okla. in T 19N, R. 25E. Property stands in my name. Make offer. Spears Havely, Richmond, Va.

Manufacturers' Agent

—ATTENTION—

MANUFACTURERS & DISTRIBUTORS

Business is quiet, yes, but it will come back. Don't pull your stocks out and neglect your customers. We have had six successful years of selling, warehousing and distributing for leading manufacturers of oil well equipment. We save you 50-75% of your overhead. Our warehouses located at Odessa, Houston & Kilgore, Tex, serve all of Texas, New Mexico, Arkansas and Louisiana. 24 hours warehouse service at all points by competent men.

THE BRANDON COMPANY
BOX 1047 ODESSA, TEXAS

Legal Blanks

BURKHART'S legal blanks and general forms serving Mid-Cont. oil field since 1908—Okla. Kans. N. Mex. Tex. Ala. Ark. Fla. Ga. Ill. Ind. Ky. La. Mich. Miss. Mo. Neb. N. Dak. Tenn. Wyo. Free catalog samples on request. Burkhart Ptg. & Sta. Co., 115 S. Cinn., Tulsa, Oklahoma.

Wanted

WANTED: Proven Oil production deals. $100,000 or more, no brokers.
M. R. TRAVIS
1702 S. Boulder. Ph. 2-2447, Tulsa, Okla.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Help Wanted

INDEPENDENT refiner, who is now building plant to manufacture 100 octane aviation gasoline, requires the services of a petroleum engineer who has had experience in the operation and design of Thermal and Catalytic Cracking Reforming, Gas Recovery and Alkylation plants. In replying give education, qualifications and refining experience in detail; also salary expected. TERMINAL REFINING CORPORATION, P. O. Box 1500, Corpus Christi, Texas.

WANTED: Man with general office or field sales experience by large reputable manufacturer of seamless and electric welded tubing, alloy and carbon steels. Please apply giving full information, experience, etc. to Box B-111 The Oil and Gas Journal, Tulsa, Okla.

CHEMICAL ENGINEERS WANTED
with any of the following experience:
1. Petroleum refinery experience in operation or design of stabilizers, absorbers and light end equipment.
2. Refinery experience in design or operation of plants for solvent dewaxing and solvent extraction of lube oils.
3. Refinery experience in design or operation Thermal or Catalytic Cracking Plants.
In reply state education qualifications and refinery experience in detail. Also salary expected and status regarding military service.
FOSTER WHEELER CORPORATION
Room 2403, 165 Broadway,
New York.

Situations Wanted

"MR. EXECUTIVE"
I HAVE HAD 12 YEARS EXPERIENCE Pipelining, gauging, refining and office work. Have broad knowledge, lease and royalty business. Now employed; desire to get with company with expansion future. Age 33, draft status 3-A. WILL START IN ANY CAPACITY AND MAKE YOU MONEY. Box B-131, The Oil and Gas Journal, Tulsa, Okla.

POSITION wanted by man having 25 years experience constructing and maintaining pipe lines. Can handle anything in erecting or repairing steel tanks. Experience in protecting steel tanks from air raids or shell fire. Can go anywhere. Box B-130, The Oil and Gas Journal, Tulsa, Okla.

FORMER Topping Plant Supt. 10 years' experience, still operation, construction and maintenance, past draft age, good reference, will go any place in U.S.A. B-142, The Oil and Gas Journal, Tulsa, Okla.

REFINERY Technician and Process Supervisor, M.I.T. graduate, 17 years' varied experience. Includes oil, waxes, asphalts, specialties, Chief Chemist, Process development, plant superintendent, management experience. Age 36. Draft status, 3-A. Box B-141, The Oil and Gas Journal, Tulsa, Okla.

GREASE Plant Manager—with wide experience in manufacturing of all types of greases and lubricating oils. Executive ability. Box B-140, The Oil and Gas Journal, Tulsa, Okla.

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma

WE BUY & SELL all types of Oil and Gas Royalties. Sales restricted to registered dealers only. Grimes Royalty Co., National Mutual Bldg., Tulsa, Okla.

FOR SALE—Landowner's Royalty under 160 acres leased to Humble Oil & Ref. Co. in Lea County, N. M., 27 pools in the county. Will sell in small interests. HARRY S. WRIGHT, FARMINGTON, NEW MEXICO.

INQUIRIES invited to buy or sell producing royalties, Illinois preferable. J. A. Wolf, 407 S. Dearborn St., Chicago, Ill.

Incorporation

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

Financing

CAPITAL SEEKERS — Interested in raising $25,000 or more for a legitimate project should communicate with AMSTER LEONARD, Fox Theater Bldg., Detroit, Mich.

OUT OF 5000 American financial houses only 223 bought small issues last few years. The 223 names $4.00. JOHN F. MORRIS, Box 5411, Philadelphia.

Equipment Wanted

WANTED
Large Steel Storage Tanks and Structural Steel Buildings.
GREENSPON'S
National Stock Yards
(St. Clair County), Ill.

WANTED
2—35,000-55,000 bbl. storage tanks.
2—1300' air compressors.
20—25 ton locomotive cranes.
R. C. STANHOPE, INC.
60 E. 42nd St., New York, N. Y.

WANTED—BULK PETROLEUM STORAGE, 10,000 BBLS. TANKS OR LARGER. Box B-120, The Oil and Gas Journal, Tulsa, Oklahoma.

EQUIPMENT WANTED

WE ARE IN URGENT NEED OF THE FOLLOWING MACHINES TO FULFILL WAR CONTRACTS

We Will Buy or Lease For the Duration

1—No. 3 or No. 5 Cincinnati Universal Milling Machine or equivalent in other good type machine.
2—No. 5, No. 1L or 3L Gisholt Turret Lathes or equivalent machines in J. & L. or Warner & Swasey.

MACHINES MUST BE IN GOOD CONDITION TO HANDLE CLOSE TOLERANCE WORK

WIRE — WRITE — CALL
Stating condition, type and price of machines.

ENGINEERING LABORATORIES, Inc.
624 East Fourth Street
Tulsa, Oklahoma, U. S. A.
Telephone—2-8291 LD—766

WANTED TO BUY: One 6-inch rotary pump and one 4-inch rotary pump. Arrow Petroleum Co., Forest Park, Illinois. Mr. Schreiber.

WANTED

3, 4, 6 and 8 INCH LINE PIPE
7"-17# CASING
State Condition, Price and Location

FRICK-REID SUPPLY COMPANY
Tulsa, Oklahoma

For Sale—Equipment

FOR SALE: 1 Brauer Steam operated shale shaker, $100. Patridge, Cities Service Oil Co., Bartlesville, Okla.

#81 KEYSTONE Spudder, 65. ft. mast, all steel, Caterpillar mount complete with 4" to 10" tools.

5 x 10 Gardner-Denver Mud Pump, 80 HP International Gas-Gasoline Motor, mounted on skids. Utility & Industrial Supply Company, Jackson, Michigan.

FOR SALE: 5—15/30 H.P. Motors, 440 volts with grids and automatic switchboxes. A-1 condition. Hotel Garage, Great Bend, Kans. Tele. 1333.

FOR SALE 38 x 7, 40 x 8, and 10.50 x 24 used tires and tubes. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE; 6 x 16 Wilson-Snyder Power Slush Pump. Melton Supply Co., Seminole, Okla.

CLASSIFIED ADVERTISING RATES

Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgment is made, and proofs cannot be shown in advance of publication.

	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
3 Lines	$1.05	$1.80	$2.55	$3.30	7 Lines	$2.45	$4.20	$5.95	$7.70
4 Lines	1.40	2.40	3.40	4.40	8 Lines	2.80	4.80	6.80	8.80
5 Lines	1.75	3.00	4.25	5.50	9 Lines	3.15	5.40	7.65	9.90
6 Lines	2.10	3.60	5.10	6.60	10 Lines	3.50	6.00	8.50	11.00

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Classified Display is set with a border and may be used in one or two column sizes.

1 Inch	1 time	$5.00
1 Inch	13 times	4.50 per inch
1 Inch	26 times	4.00 per inch
1 Inch	52 times	3.50 per inch

This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

PRESSURE VESSELS—PUMPS—BUBBLE TOWERS—TANKS
VALVES and FITTINGS—HEAT EXCHANGERS—COMPRESSORS

Fully Reconditioned Refinery Equipment All Kinds

Send Us Your Inquiries—No Priorities Required

SONKEN-GALAMBA SUPPLY COMPANY

W. C. Berry or H. J. Galamba
Riverview at Second, Kansas City, Kansas

Robt. W. Duden
2100 S. Union, Tulsa, Oklahoma

ALL OR ANY PART—COMPLETE 2000 BARREL REFINERY

Bubble Tower 5'x52'x⅜" — 21 Trays With Caps Chrome Alloy — 2000 bbl. Pipe Still, 2½" ID x 2 15/16" OD x 20' Tubes Alloy Headers — 8 Heat Exchangers, 255 sq. ft. ea. All New Tubes — Complete Copper Sweetening Unit — New Carload Ethyl Plant — 47 Storage Tanks from 500 to 15000 bbl. cap. — 30 Pumps All Types — Valves — Fittings — Pipe

THE PLAINS OIL & REFINING CORPORATION
GREAT BEND, KANSAS

NEW—COMPLETE

2 Jensen Bros. pumping units, size 12D, cable type, 34" stroke, with Allis-Chalmers Model B-15 power units equipped with Ensign carburetors for butane-natural gas-gasoline, with controls, etc.

SONKEN-GALAMBA SUPPLY CO.
TULSA, OKLAHOMA

FOR SALE—24,000' of ⅝" and 3000' of ¾" Pump Rods. One 87' MIW 157,000 lb. Derrick. One TC20B Oil Well Pump Unit, and misc. pumping equipment. All in first class condition. Dirks Brothers, Tuleta, Bee County, Texas.

FOR SALE: At Oklahoma City, 65, 70, 75 and 85 HP Oil Field Type Boilers, repaired, tested and ready to go. Also large stock of unrepaired boilers. Patridge, Cities Service Oil Company, Bartlesville, Okla.

COMPRESSOR CYLINDERS

2—18 x 20 Type S Clark
1—17 x 20 Type S Clark
1—16 x 20 V.H. Bessemer
1—15 x 20 V.H. Bessemer
1—7½ x 20 — 750# W.P. Bessemer
1—8½ x 20 Worthington
1—15 x 20 Worthington
3—16 x 20 Ingersoll-Rand

All above reconditioned and ready for work.

W. S. SMITH, 523 Thompson Bldg.
Tulsa, Okla. Phone 2-5473

FOR SALE—Casinghead Gasoline Plant—Old Style, Absorption Type. Throughput Capacity—10,000 MCF. Good Condition and Complete. Shut down June 1, 1942. Location—Bristow, Oklahoma. Oklahoma Utilities Company, Ft. Worth, Tex.

FOR SALE: 12 K.W. Portable Light Plant powered by 35 H.P. International Engine. Melton Supply Co., Seminole, Okla.

FOR SALE: Burrton, Kansas, dismantled 122' Parkersburg Angle Iron Rotary Derrick. Complete with safety top, bull, calf wheel girt, outside framer sills, $700. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE

COMPRESSORS

Complete Repressuring or Air Lift Plant for Immediate Delivery.

2—13 & 5½ x 12 Ingersoll-Rand XOB compressors 400# pressure V-belt driven by 120 H.P. Chicago Pneumatic 3-cylinder vertical gas engines.
2—12 & 7 x 10 Chicago Pneumatic 400# pressure vertical compressors direct connected to 120 H.P. 3-cylinder Chicago Pneumatic vertical gas engines complete.

Used very little—excellent condition. Located on original foundation in Louisiana.

EARL E. KNOX COMPANY
Erie, Penna.

NEW COUPLINGS: 500 2½" Upset Tubing 10 V and 11½ thread, 2000 line and casing, sizes ¼ to 6" inclusive. Write Daniel A. Moritz Company, McKeesport, Pa.

FOR SALE: 27½" Ideal Rotary Table, 5 sheave 200 ton Crown Block, 4 sheave 72" traveling block, 8" Ideal enclosed rotary hook. Melton Machinery & Supply Co., Seminole, Okla.

NEW POWER UNITS

Four Caterpillar gasoline motors, new, 75 H.P. complete with governors, master clutch, carburetor, and magneto, not mounted, suitable for power unit; $395.00 each. O. C. Evans, Mt. Sterling, Ky.

EMCO-McGAUGHY Integrator for Foxboro and Emco Recording Orifice Meter Charts, good condition. Utility & Industrial Supply Co., Jackson, Michigan.

I have sold second-hand alloyed once run Okla City Sucker rods to the largest independent oil producers in Kansas, Okla. & Texas, five producers have bought from 50 to 300,000 ft. all with good results. I am subject to call at anytime. I will dispose of the balance of ¾", ⅞" & 1" in truck load lots delivered to your location on 60 days trial, for about half of new price. Your use subject to the approval of my engineer. Can also be used for pull rods. Six 2½" x 7" Guiberson tubing catchers and six 2½" sucker rod overshots.

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FOR SALE: 1 Askenia Type Magnetometer #7970, $750.00. Cities Service Oil Co., Bartlesville, Okla.—H. D. Patridge.

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IN GOOD CONDITION

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1—5,000 Bbl.
1—4,400 Bbl.
3—2,500 Bbl.
1—3,000 Bbl.
1—1,000 Bbl.
1— 600 Bbl.
1— 100 Bbl.
2—1,200 Bbl. Agitators (prac. new)

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FOR SALE: Two 200 H.P. Electric Motors complete with grids and controls. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE: 2—75 H.P. Fairbanks-Morse Type Y Oil Engines. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE: Two Model 35 Six Cylinder 10 x 12½ Two Cycle, each 240 HP constant at 400 RPM or 375 HP hoisting at full speed, Fairbanks-Morse Diesel Engines equipped with clutches and mounted on steel skids. Same overhauled thoroughly by factory mechanic and in A No. 1 condition. Can be seen at Loffland Bros. Company's Warehouse at Thompson, Texas. Price on application. DRILLERS SUPPLY OF TEXAS, P. O. Box 915, Ft. Worth, Texas.

FOR SALE: 28" Engine Bed Lathe; 24" Back Geared Drill Press; 12" to 5" Pipe Machine with new Dies; 6" to 1" Pipe Machine; general machine shop equipment, motors and tools.

OSAGE OIL FIELD SERVICE
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Hominy, Oklahoma

FOR SALE: Double Drum Drilling-in and Clean-out unit with Spudding attachment, capable to 5500 feet. A-1 condition, with 55 foot sectional sheave roller-bearing mast. Price $3000. For quick sale. Terms. Box 133, McPherson, Kansas.

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25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x8 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list. Terms to suit.

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26 West 2nd St., Cincinnati, Ohio

FOR SALE: Wilson-Mogul Drawworks with water cooled brakes and 100 H.P. International Motor. Melton Supply Co., Seminole, Oklahoma.

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DOUBLE EAGLE REFG. CO.
1900 East First St.,
Tel. 2-2428—Oklahoma City, Okla.

FOR SALE: 2 Chgo. Pneumatic Air compressors, 11-X-5-12. A-1 Condition. Emco Eqpt. Co., 1st Natl. Bldg., Oklahoma City.

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Tulsa, Oklahoma.

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AUCTION SALE
LINE PIPE AND EQUIPMENT

Pursuant to Order of Sale made by the U. S. District Court, Eastern District of Illinois, and subject to approval thereby, I, the undersigned Trustee, will sell at public auction from storage yard, 215 North Locust Street, Centralia, Illinois, at 11:00 A.M. on Monday, June 29, 1942, certain physical assets of this estate, including approximately 36,000' of 4½" O.D., 3,000' of 4" O.D. and 153' of 6" O.D. line pipe, formerly in welded line; also, miscellaneous gates, valves, and other pipe line connections; also, 2 Buda motors with 6 x 4 Wheatley piston pumps, and 1 Hercules motor with 4 GR Worthington rotary pump. Terms, cash.

J. KYLE FOSTER, TRUSTEE
R. HAL COMPTON CRUDE OIL PURCHASING CO., DEBTOR
709 Chemical Building St. Louis, Mo. Phone: Chestnut 3470

Journalisms:

A HYDROCARBON is a number of balls with sticks joining the balls together. There are big balls called carbon from which sticks project outward like on a mangy porcupine. Each carbon ball has four sticks. On the other end of the sticks there may be another big ball or a little one called a hydrogen atom.

Petro-chemistry consists of rearranging the balls and sticks in various ways. The rules are simple. For example, a little ball can't have more than one stick sticking into it. In using your son's Erecto set for petro-chemistry set aside all little balls with holes for more than one stick. These can be used in a slingshot against the neighbor's cats.

When you get a lot of balls arranged in a spiral with loops, that is rubber. If you get a different combination, send it to the Journal's refinery editor, who will prepare a flow diagram. The flow diagram will be deleted by the censor, which will entitle you to another try. There is virtually no limit to the combinations of balls and sticks that you can make.

The above might be called "Introduction of Petro-Chemistry Provides Scope for Ingenuity." Seriously, the section in next week's Journal devoted to petro-chemistry is something you'll not want to miss. The editors have assembled an exhaustive lot of information on the developments which are taking place in this infant industry.

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LAST week we published a story about Phillips Petroleum Co. celebrating its twenty-fifth birthday anniversary. In it there was a brief biographical sketch of Frank Phillips. An eagle-eyed reader noted a typographical slip that escaped the usually watchful eyes of our proofreaders, which caused Mr. Phillips' birthdate to be November 28, 1973. The reader writes us that it strikes him that Mr. Phillips might possibly be able to tell us when the present war ended.

We'd all like to know the answer to that one, Mr. Beckelhymer. But we doubt that Mr. Phillips could provide it, even though we did inadvertently advance the date of his birth a hundred years, which would put him in the know.

•

THE rubber shortage is not without its compensations. For one thing, it is aiding and abetting the "Good Neighbor" policy. The share-your-car movement is bringing neighbors who until Pearl Harbor had only a nodding acquaintance with one another into closer contact as they take turns in picking each other up for the trip downtown to business every morning. In the confines of an automobile conversation comes naturally and many of us are learning that the guy next door is a pretty good sort. Some oil men have expressed the fear that should this trend take hold and become permanent after the war, the oil industry would be the loser. And maybe it would. But the chances are that once rubber becomes plentiful again, we'll lapse back into our prewar habits. And each of us will back the family sedan out of the garage every morning and go downtown empty save for the left front seat. And gradually the warbred intimacy with our erstwhile copassengers will taper off until we'll again accord them only a preoccupied nod.

•

THE oil industry is to be congratulated in having such outstanding house organs, or employe magazines. These have always served a highly useful purpose, but with the advent of war, the editors of these interesting and well-edited papers have seized upon a theme that is most commendable. And that is, to provide a medium of communication between those employes who have entered the services of the armed forces and those who are keeping the wheels turning back home. Pages are enlivened by pictures of the boys in camp, and some of the more enterprising editors are printing real feature stories on activities of the paratroopers, skitroopers and so on. And with the exciting pictures furnished by the boys themselves. Naturally nothing of a nature objectionable to the censors is published, as the editors have been thoroughly posted by the Army on what can and cannot be printed.

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CALENDAR

June

AMERICAN SOCIETY OF TESTING MATERIALS, Chalfonte-Haddon Hall, Atlantic City, N. J., June 22-26.

September

NATIONAL PETROLEUM ASSOCIATION, annual meeting, Hotel Traymore, Atlantic City, N. J., September 16-18.

October

NATIONAL SAFETY CONGRESS AND EXPOSITION, Stevens Hotel, Chicago, October 5-9.

TEXAS MID-CONTINENT OIL AND GAS ASSOCIATION, twenty-third annual meeting, Dallas, Tex., October 8-10.

NATIONAL STRIPPER WELL ASSOCIATION, annual convention, Wichita, Kans., October 19.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, fall meeting, Rochester, N. Y., October 12-14.

INDIANA INDEPENDENT PETROLEUM ASSOCIATION, fall meeting, Hotel Severin, Indianapolis, Ind., October 14-15.

NATIONAL STRIPPER WELL ASSOCIATION, annual meeting, Wichita, Kans., October 19.

INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA, thirteenth annual convention, Wichita, Kans., October 20-22.

NATIONAL LUBRICATING GREASE INSTITUTE, tenth annual meeting, New Orleans, La., October 25-29.

ILLINOIS MINERAL INDUSTRIES CONFERENCE, Campus, University of Illinois, Urbana, Ill., October 30-31.

November

AMERICAN PETROLEUM INSTITUTE, twenty third annual meeting, Stevens Hotel, Chicago, Ill., November 9-13.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, thirty-fifth annual meeting, Netherlands Plaza Hotel, Cincinnati, Ohio, November 16-18.

AMERICAN CHEMICAL SOCIETY, national chemical exposition and national industrial chemical conference, Stevens Hotel, Chicago, Ill., November 17-21.

NATIONAL CHEMICAL EXPOSITION AND NATIONAL INDUSTRIAL CHEMICAL CONFERENCE, annual meeting, Stevens Hotel, Chicago, Ill., November 17-22.

December

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, annual meeting, New York, November 30-December 4.

PETROLEUM ACCOUNTANTS SOCIETY OF OKLAHOMA, Hotel Mayo, Tulsa, December 17.